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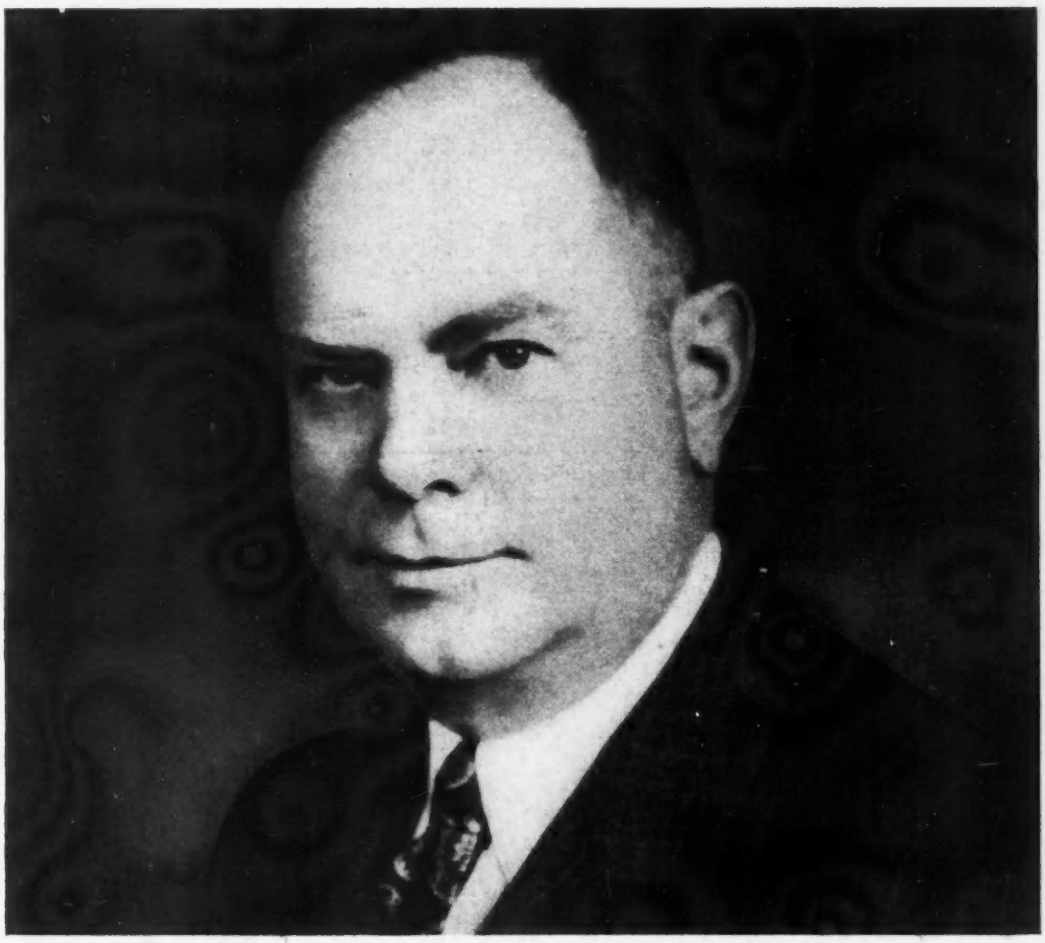
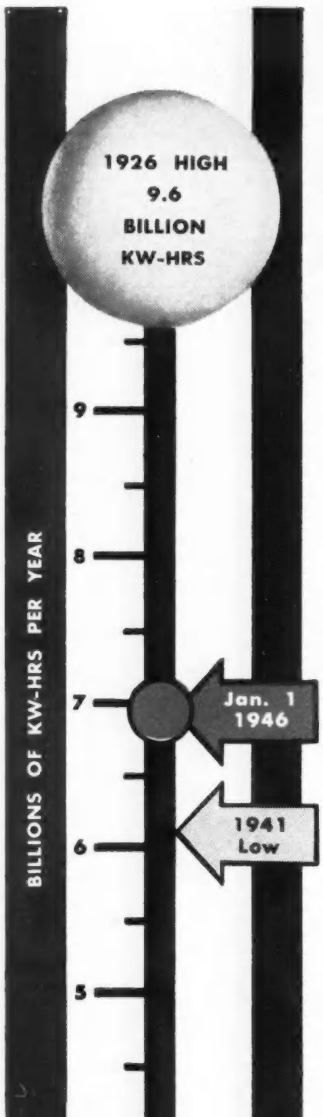
Electrical World

NEWS ISSUE SEPTEMBER 21, 1946



Carl H. Giroux, Special Assistant to the Chief of Engineers, Honored by War Department

A McGRAW-HILL PUBLICATION



YOURS FOR THE SELLING... 3½ BILLION KW-HRS!

In many cities the lost transit load is being regained. Here's why this load is well worth going after in your city.

Biggest load

On the table below select the size city you serve to get an approximate idea of the volume of business you could be handling. How does this compare with your present transit load? How does it compare with your largest industrial load?

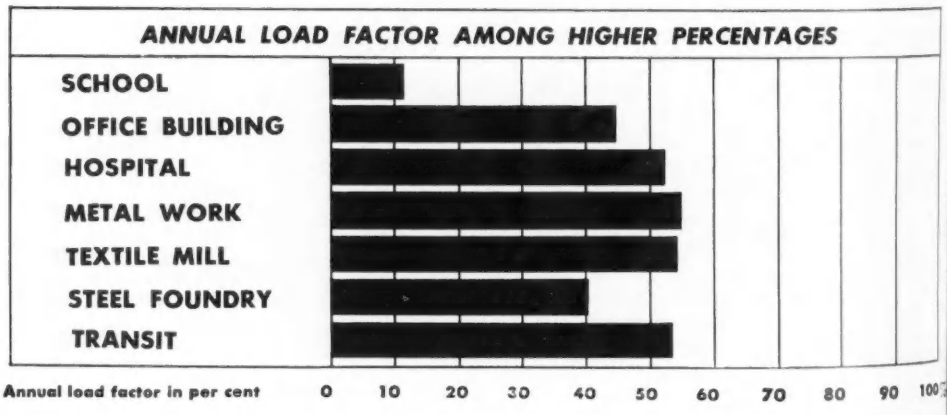
POPULATION OF CITY (1940 census)	ELECTRICS NEEDED	ESTIMATED ANNUAL KW-HRS
100,000	40	7,000,000
250,000	208	36,400,000
500,000	650	113,750,000
750,000	860	150,500,000
1,000,000	1350	236,250,000

Big annual load factor

A very desirable annual load factor is characteristic of the transit load, as shown below.

Similar studies show that revenues from transit can produce a satisfactory return and that the transit load does not add to system peaks.

In most ways, it's a *brand new* load—new in its improved characteristics—new in its possibilities for increasing your earning power. Now—while plans for modernizing rolling stock are sweeping through the transit industry—now is the time to investigate the application of load-building trolley coaches, streetcars, and rapid-transit trains in your city. *Apparatus Dept., General Electric Company, Schenectady 5, New York.*



(Typical examples taken at random from actual records of power companies or publications of the Edison Electric Institute.)

WHAT IT TAKES TO RING THE BELL

In 1941, streetcars, trolley coaches, and rapid-transit trains consumed 6.09 billion kw-hrs. By the end of 1945, transit power consumption had increased to a total of 6.928 billion kw-hrs. It has to increase another 2.6 billion to ring the bell.

Lifestream of the City, a new More Power to America sound, color movie presents the city traffic problem in a new light. You'll like it. It promotes electric transit and increased power consumption.
If you haven't yet seen it, ask your G-E representative to arrange for a showing.

GENERAL ELECTRIC

ELECTRICAL WORLD

NEWS ISSUE

LUME 126 NUMBER 12

SEPTEMBER 21, 1946

nited States Power Experts Recruited to Advise Mexico

ormer OWU Officials, Headed by Edward Falck, Will Advise Mexican Government on Ways and Means of Solving Post-War roblems—Procedures Developed During War Will Be Followed

e Mexican government, faced with th an immediate and a long term itical power shortage, is recruiting skeleton staff of war-time Office of ar Utilities officials in the United ates to develop a power mobilization ogram for Mexico, it was learned this eek.

Director of the staff is Edward Falck, rmer head of OWU and now a private dustrial and utility consultant. Also gned up to participate in the Mexican ogram are Walker Cisler, Detroit ison Co., who was in charge of utility storation for the Army in reoccupied rope during the war and before that s chief of OWU's Equipment Divi-on; Charles Collier, vice president Georgia Power Co., who was active both the 1941 Southeastern Power rtailment program and the 1945 rownout"; and Herbert S. Marks, st counsel for OWU and one time ad of its Power Division.

The assignment of the American offi-als in Mexico, it is understood, will volve advising and assisting the Mexi-an government in getting underway an mediate and long term power con-rvation, utilization, and development ogram drawn from the techniques veloped by OWU for meeting war-me power problems in this country. he immediate portion of the job is expected to be patterned along the lines of the war-time "brownout" and the earlier Southeastern curtailment and the "pooling" and integration features of limitation order L-94. Long range, the program involves application of OWU techniques for expansion by perhaps as much as 100 percent of Mexico's power generating and distribution capacity, both through scheduling additional installations and through greater integration and better utilization of existing equipment.

The 1941 Southeastern power curtailment order involved procedures for percentage curtailment of industrial loads and for staggering of industrial power demands to meet an acute water shortage condition. The actual curtailments were never imposed, except for dousing such non-essential lighting as display and advertising illumination in what later proved to be a "dress rehearsal" for the 1945 "brownout." OWU established a special Atlanta office to administer the Southeastern program, with Falck, Collier and Marks among those on the staff. Out of this program grew OWU's subsequent methods of preparing for energy curtailments during the war period.

Falck already has made one trip to Mexico City and is expected to return, with the others, around October 1 to begin work. They expect to remain in Mexico about two months.

Commenting upon the assignment, Falck said he anticipated the job to divide itself into a four-sided problem —fuel, equipment, integration, and conservation and utilization, in that order of importance.

The fuel problem, like that of OWU during the war, involves preparation of plans and programs for insuring that adequate fuel supplies are earmarked and delivered to Mexico's generating facilities, many of which today are not operating at capacity for lack of fuel. Second will come the job of inventorying Mexico's existing capacity and plotting future development and expansion, using the experience that OWU gained in determining authorization of additional capacity in this country during the war.

More Efficient Line Use Desired

Third will be the relatively short-term job of canvassing existing transmission lines and putting them to full use and of determining the maximum possible additional utilization possible quickly from additional tie-lines. Fourth phase of the job will involve laying out programs for possible curtailment of electricity and for staggering industrial loads so as to increase the load factor on existing equipment.

Mexico today has roughly 1,000,000 kw. of installed capacity, in hydro, steam and diesel generation, much of it now interconnected. The national power plant is little different than it was a decade ago, and no new industrial load is being permitted on the power lines—a condition which is seriously interfering with industrial development of the country in the post-war period.

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War Department Honors Carl H. Giroux with Medal

(See Front Cover)

The War Department's exceptional civilian service medal has been awarded Carl H. Giroux, who, since 1942, has been special assistant to the Chief of Engineers.

The award was made for Mr. Giroux's "outstanding accomplishments in World War II." During this time, he climaxed a 23-year career with the War Department with his work on power supply for war industries, the development of such special equipment as portable diesel-powered generators for forward and rear-area power supply, development of the 30,000-kw. floating power plants which served in both the European and Pacific theaters, and on the atomic bomb.

As consultant to the Manhattan Engineer District, developer of the A-bomb, Mr. Giroux assisted both in the development of the 240,000-kw. power plant at Oak Ridge, and in development of the electrical equipment used in the manufacturing plants there and at Hanford, Wash.

A graduate in electrical engineering of the University of Colorado, Mr. Giroux began his career with the General Electric Co. He served in GE's Test Department before designing interurban and subway railway equipment. During the first war, he was in GE's Marine Engineering Department, working on development of ship propulsion equipment and shipboard auxiliaries for the Navy and Merchant Marine.

He joined the War Department in January, 1923, working on its dredging program. Later, he headed its Marine Design division for several years, developing floating equipment for the Corps of Engineers. Still later he joined the Engineering Division of the Office of the Chief of Engineers, where he participated in the design and construction of such projects as the Bonneville and Fort Peck Dams, flood control projects and the department's lock and dam program.

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Monthly Billing Restored

Cleveland Electric Illuminating Co. is again billing its customers monthly instead of bimonthly.

St. Louis Extends Contract with Union Electric Co

The Board of Public Service of St. Louis has voted to extend to December 31, 1946, the contract with the Union Electric Co. of Missouri under which the city purchases more than $340,000 of electrical energy annually for municipal purposes. The contract would have expired on August 31.

The old contract, signed ten years ago, was extended because a new contract must be approved by the Board of Aldermen, which is in recess until October. The city is seeking lower rates in a new contract and is considering building a municipal plant.

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Rural Loans Granted

The Rural Electrification Administration in the period from August 5 to 29 announced loans totalling $23,178,000 to 71 cooperatives and one municipality in 25 states. Most of the loans were for the construction of lines of which 15,025 miles are to be built to serve 43,467 customers.

Business and the Stock Market Collapse

DEXTER KEEZER, Director, Economics Department, McGraw-Hill Publishing Co.

Over recent months it had been widely predicted that the high level of business activity, with its strong upward push on the demand for electricity, would be sustained in 1947. Does the recent collapse of the stock market mean that this prediction needs to be re-evaluated? The best answer seems to be "No."

The basic outlook for production remains unchanged. Consumers and business still have a huge backlog of unfilled demand, particularly for durables—homes, autos, machinery and many kinds of electrical appliances. Moreover, they have both savings and credit with which to back up this demand. Cut-backs may possibly develop in certain nondurables—clothing for example—especially if inventory buying declines. But the rising output of durables should offset any such reduction in other lines.

Does this mean that the stock market fall doesn't make sense? No. Several factors appear to have combined to cause it.

1. The low level of interest rates had helped boost stock prices to their high level. Stock quotations, of course, reflect the possibilities of making money on stock dividends as compared to other forms of investment. With interest very low, stocks became more desirable. But two developments recently have caused interest rates to firm: Washington set out to raise them because "easy" money contributed to inflation; and industry has been going to banks to borrow money for reconversion and expansion. The combination has raised interest rates and contributed to attracting money away from stocks.

2. Technical factors, independent of business, weakened the market. The elimination of margin trading reduced the volume of transactions, thus intensifying the downward movement. The capital gains tax provision, under which investors profit by holding securities six months or more, worked to encourage selling at this time. And the tangled international situation contributed to it all.

3. The real function of the stock market is to evaluate, not business activity, but future profits. Wall Street recently has been revising profits prospects downward, entirely apart from any expectations as to future demand. Uncertainty about the labor situation is the main problem. Strikes slash profits and wage boosts squeeze them. Fear of lower profits, in a situation where the market had already been weakened by other factors independent of business, has been the most important cause of the market break.

The stock break, though it doesn't mirror business activity, could affect business by making new security issues to raise capital untimely, and thus postponing capital expansion. Also the break wiped out some paper profits and buying power, although this is small when compared with the total buying power in the hands of business and consumers.

It's by no means certain that the September drop will inaugurate a "bear" period of continuing decline in stock quotations. If it does, it wouldn't be the first time the stock market trend has diverged from the business trend.

Union Leader's Arbitration Pledge Dims Strike Threat

Duquesne Light Co. and Union in Agreement on Continuance of Restraining Order Which Kept Lights on in Pittsburgh —Leo T. Crowley Joins Utility Officials in Negotiations

PITTSBURGH'S power strike threat was alive only technically this week after President George Mueller, of the Independent Association of Employees of Duquesne Light Co. and Associated Companies, agreed to recommend that his membership accept arbitration.

The union met September 20 to vote on the issue, but the move was expected to be no more than a formality. Mueller's acceptance of arbitration, a few hours before a scheduled court hearing on a preliminary injunction against any disruption of electric service either by company or union, called off legal action in the most striking move against a power stoppage since Virginia's Governor Tuck mustered employees of the Virginia Electric & Power Co. into the state guard last spring, to avert a shutdown there.

Mueller Agrees to Arbitrate

City officials went to court September 13 to ask not a preliminary injunction but merely a continuance of the restraining order which had halted the strike four days previously. Counsel for the company and the union concurred. This followed Mueller's acceptance of an earlier offer by Duquesne Light Co. to arbitrate the 35 contract demands made by the Independent Association. They will return to court September 24, when, if arbitration has finally been accepted by the union, the restraining order either will be dropped or continued until the arbitration settlement is in effect. It was expected that the city would keep the restraining order on the books, even though dormant, until final peace terms between the union and company have been made effective. Under that procedure, it could be invoked again should any renewed strike threat arise out of the present case.

Mueller's acceptance of arbitration followed a 10-hour meeting at which the company was represented not only by its negotiators and its president, Pressly H. McCance, but by Leo T. Crowley, Board Chairman and President of Standard Gas and Electric Co., a parent of Duquesne. Crowley was the only officer or director of Duquesne's parent companies to attend the session. All had been summoned to negotiate with the union by the restraining order which halted the strike. The summons, ineffective legally since most, if not all, of them live outside Pennsylvania, was undertaken by the city as much for its political effect as for any other reason, ELECTRICAL WORLD learned authoritatively.

The arbitration agreement provided that each party shall name an arbitrator, with a third to be picked by the U. S. Secretary of Labor. Awards are to be final and binding, and each side may present whatever evidence it cares to regarding applicability or non-applicability of the National Wage Stabilization Policy to the awards.

In addition, both Duquesne and the union will establish five-man committees, to be headed respectively by McCance and Mueller, so that "our labor differences may be worked out in the future in a more satisfactory manner."

Pittsburgh's Mayor David L. Lawrence, who announced Mueller's agreement to arbitration, asserted that:

"It is my hope and belief that we are now 'out of the woods.' There should be a new era in the labor-management relationships of the company and its people. The future should see a stable and harmonious policy between the company and the union. . . . Tonight's agreement should be a step in making our future secure."

All 35 of the union's contract demands upon the company will be open to arbitration. During negotiations leading to the short-lived and ineffective strike last week, company officials estimated that the total cost of the concessions demanded by the union would approximate $22,000,000 annually, most of it in the pension system. Duquesne's net income in 1945 was $9,617,496.

It was learned that Mueller refused to accept arbitration if the agreement provided that any wage awards would be subject to National Wage Stabilization Policy. This was regarded as significant, since the arbitration award which grew out of last February's strike was over the amount allowed by the Wage Stabilization Board in seven of nine items. That arbitration was binding upon the company, with the result that it has been paying from 2 cents to 13 cents per hour more than it would be allowed to cite as a legitimate cost increase if it decided to apply to the Pennsylvania Utilities Commission for rate increases.

No Strike at Pittsburgh!

How Pittsburgh averted a utility strike that threatened to turn into a public disaster will be told in next week's issue by Richard N. Larkin, associate editor of ELECTRICAL WORLD.

Larkin, who was on the scene, will weigh steps taken by Mayor Lawrence in the light of attempts that have been made elsewhere to prevent shutdowns of utility service.

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Municipal Authority Seeks FPC Permit for 3 Dams

Application for a preliminary permit for a three-dam hydroelectric development on South Carolina's Congaree and Broad Rivers, with a supporting 60,000-kw. steam station, has been made to the Federal Power Commission by the Lyles Ford Tri-County Power Authority, a municipal corporation in South Carolina.

Estimated cost of the project, which would include 400 miles of transmission lines, was set at $57,470,000.

The preliminary permit was sought to establish the Authority's priority on the development, and, if granted, would give the agency 24 months in which to prepare data supporting its request for a license to construct the separate parts of the projects.

Three concrete dams are projected. One is the 39,000-kw. Columbia Regulating Dam on the Congaree at Columbia. Another is the 108,000-kw. Blairs Dam on the Broad River at Blairs, S. C., 17 miles west of Winnsboro. Third is the 96,000-kw. Frost Shoals Dam on the Broad, 6 miles above Columbia. The development would be aimed at serving the "populous industrial Piedmont section of South Carolina," FPC's announcement said. Columbia is now served by the South Carolina Electric & Gas Co.

The application asserted that while the development would be primarily for power, regulation of stream flows would promote flood control and permit navigation through an 8-ft. channel from Charleston to Columbia with minimum stream bed improvements.

FPC May Give Early Ruling on Hydro Permits for Utilities

Commission May Bypass Federal Agencies to Hurry Decision on Its Legal Right to Grant Licenses to Private Utilities for Projects at Sites Authorized for Federal Development

POSSIBILITY that the Federal Power Commission may adopt an early ruling on whether it has the legal right to grant private licenses for the development of hydroelectric sites which have been authorized and given appropriations for federal development arose this week.

A commission member told ELECTRICAL WORLD that FPC may rule on the question without awaiting replies from all government agencies which normally are asked to pass upon various features of license applications. He added, however, that this question is not now formally upon the commission's agenda, and that there is now no way of telling whether or when such a ruling would be considered.

Other Agencies Take Months to Act

Under normal procedure, license applications are cleared with various federal bureaus, as they affect the jurisdiction of other agencies than FPC. Thus, Interior's Public Lands group would check the status of any federal lands which would be affected by a proposed reservoir; the War Department would check plans for dams, powerhouses and similar works; the Reclamation Bureau would clear any project phases touching upon irrigation and reclamation, etc. Normally, such clearings take months but are completed before the commission as a whole considers a license application.

Currently, FPC has before it two applications for private participation in hydroelectric project development which has been authorized and given appropriations for federal development. First of these private applications is that of Arkansas Power & Light Co. for a license to erect a power plant at the Bull Shoals Dam, which the Army Engineers are building on Arkansas' White River. Second is Georgia Power Co.'s application for a license to erect Clark's Hill dam and power plant on the Savannah River 20 miles above Augusta, Ga.

It was explained that if FPC were to rule on either or both licenses before all normal clearances are obtained, it would not be a prejudging of the case. Any such move would be based on the unusual problem posed by the co-existence of private applications and federal authorization and appropriation for the same projects. At least two sections of the Federal Power Act are widely construed in Washington as casting grave doubt upon the authority of FPC to grant such private applications as have been filed by the two utilities.

Meanwhile, opposition to Georgia's application continued to be vigorous. Sen. Burnet R. Maybank, South Carolina Democrat, conferred last week with President Truman and FPC Chairman Leland Olds, expressing opposition to the granting of Georgia's application for the Clark's Hill license.

Olds assured Sen. Maybank that FPC would consider fully the authorization and appropriations granted the Corps of Engineers for construction at Clark's Hill, after Maybank had urged rejection of the Georgia license. After his conference with the President, Maybank was quoted as saying that he had been told by Mr. Truman that the plant would be government-operated and completed as soon as manpower and materials would permit.

FPC, meanwhile, has received protests against granting of Georgia's application from many local sources.

I.B.E.W. Elects Dan Tracy; President Brown Defeated

Dan W. Tracy, recently resigned assistant Secretary of Labor, ousted Ed J. Brown, incumbent president of the International Brotherhood of Electrical Workers, A.F.L., at a stormy San Francisco convention in early September and pro-Tracy men took almost every office on a disputed slate. G. M. Bugniazet was reelected secretary and William Hogan, treasurer.

Tracy is a former president of the union, having left the office to accept his appointment to the Labor Department from the late President Roosevelt.

All ten vice-presidencies were taken by candidates supported or approved by Tracy in a minor office battle that was the first in many years. Usually vice-presidents and executive council members are elected without opposition after selection by district caucuses.

Policy decisions made by the convention included approval of a proposed employer-employee pension plan which would raise pensions from $40 to $50 a month; a decision to allow women members to become eligible for office after five years of good standing in I.B.E.W.; rejection of a plan requiring a majority for election of international president; creation of the post of government employee representative with headquarters in Washington, D. C.; creation of an "AB" membership, giving former "B" members the right to vote on all matters except pensions or insurance ("B" members, who have not applied for insurance or pension benefits, formerly had one vote for every 100 members); and formal opposition to exportation of any building materials until needs in the United States are supplied.

I.B.E.W. ELECTS—Dan W. Tracy, newly elected president of the International Brotherhood of Electrical Workers, is flanked on his right by J. Scott Milne, vice-president of the Pacific Coast area; and on his left by Charles Foehn, San Francisco, a member of the executive council of the union

Rededication Ceremonies Held at Lighting Institute

Closed During War, Nela Park Reopened in 25th Anniversary Year of First Institute—Charles E. Wilson, G.E. President, Emphasizes Educational Assistance to All Lighting Industry

IN A SPECIAL CEREMONY participated in by a large number of guests, officers of the company, Governor Frank J. Lausche of Ohio, and Mrs. Thomas A. Edison, widow of the inventor of the incandescent lamp, the General Electric Lighting Institute at Nela Park, Cleveland, was rededicated last week. This year marks the twenty-fifth anniversary of the first Institute school. In the quarter of a century of its existence it has attracted students of lighting from all parts of the world and has given lighting education to more people than any other institution.

Emphasis upon the educational assistance which the Institute offers to all elements of the lighting industry was made by Charles E. Wilson, president of General Electric, who pointed out that there is no foreseeable end to the job of putting more light into the world. Likewise, he said there was no foreseeable point at which quality and efficiency of light services could not be improved and that there still is a great deal of ground to be covered before the cost of light reaches a final practices resistance-point.

Touching on the business outlook, Mr. Wilson said that however bad the situation appears to be, he could not find the future black or barren. "With the increases in production which we have every reasonable right to expect," he said, "we should shortly be faced with a real challenge—the need to boost efficiency and boost output per worker to new all-time highs."

As in the past the Institute, according to M. L. Sloan, vice-president and general manager of the lamp department, will be used not only as a means for experimentation in light use by the company's engineers but will be open also to the entire lighting industry and its customers.

Courses in the new Institute are set up to last a week each and are now booked solidly until long into 1947, it was stated by Ward Harrison, director of engineering.

From the entrance on, the Institute has been completely rebuilt with emphasis on commercial and home lighting. There have also been introduced special demonstrations on quantity and quality of light and also color and its effect on merchandise.

Among the displays are a "sundeck" capable of furnishing 3,000 to 5,000 foot-candles with infrared and ultraviolet radiation equivalent to that of midsummer sunshine, a schoolroom with means for controlling brightness at higher lighting levels, an office with upwards of 200 foot-candles and an office lighting room with all the lighting variables, home lighting demonstrations with movable walls, and a shopping center with several types of stores. Industrial lighting is shown in the work shop for building displays.

As was emphasized by Mr. Sloan, the new Institute is in effect a laboratory for studying the actual use of light. While in many respects the displays are far ahead of current practice, the desire of the designers was to show how the new lighting tools developed and improved during the war years could be put to practical use in homes, stores, and industries.

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Co-op-Utility Cooperation Given Wickard Approval

Rural Electrification Administrator Claude R. Wickard told an Iowa audience this week that REA policy is to provide an adequate supply of energy for rural systems first, and second, to make it available at the lowest possible cost.

Wickard told a meeting of the Iowa Rural Electric Cooperative Association, at Des Moines, that if such policy can be carried out by purchasing energy from private companies, co-ops will buy such energy; that if it requires co-op generation, loans will be made for co-op-owned plants, and that "if it is advantageous to the co-ops to enter into agreements and interchanges of facilities and power with power companies to get adequate service at low cost, then I am in favor of that."

Wickard said several Iowa co-ops are negotiating with the Iowa Power & Light Co. for joint use of generation and transmission facilities, adding that "this arrangement seems to offer an opportunity for better service at lower cost. If that is true, I am in favor of it."

"The great need in Iowa," Wickard continued, "is for generation and transmission capacity equal to the needs of REA co-ops. As a matter of fact, the extension of rural lines is being jeopardized and in some cases actually halted because of the shortage of generation and transmission capacity."

REBUILT LIGHTING INSTITUTE—Left, Schoolroom with 110 foot-candles demonstrates brightness control at high levels through deep shields. Center, Horizon House displays new techniques with combinations of lighting. Right, one of several displays to show modern means of stimulating retail sales through flexible lighting

NEWS ABOUT PEOPLE

Westchester Lighting Elects Bischoff Vice-President

Frank J. Bischoff, who has been controller of Consolidated Edison Co. of New York, Inc., for the past 23 years, has been elected a vice-president of the Westchester Lighting Co., which is part of the Consolidated Edison System. Charles E. Eble was elected controller of the Consolidated Edison Co., and

F. J. BISCHOFF

was also appointed controller of the New York Steam Corp. He was formerly senior assistant controller of Consolidated Edison.

Mr. Bischoff has been with the Consolidated Edison System since 1903. He held various positions in the accounting department of the company. In 1918 he enlisted for military service in World War I. He was elected controller of the company in 1923 and controller of New York Steam in 1943.

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▶ JOSEPH G. TARBOUX, head of the department of electrical engineering, University of Tennessee, since 1929, and former Cornell faculty member, has been appointed professor of electrical engineering at Cornell University. In addition to his academic work, Professor Tarboux has had extensive practical engineering experience with utility and electrical manufacturing companies. Contributor to many engineering publications, he is also author of several books on electric power systems including "Electric Power Equipment" and "Introduction to Electric Power Systems." Professor Tarboux is a fellow of the American Institute of Electrical Engineers.

▶ EDWARD J. BRILL of Hazleton, Pa., has been appointed director of the employee relations department recently organized by the Pennsylvania Power & Light Co. Mr. Brill started his career in the electric industry with the Columbia and Montour Electric Co., predecessor of Pennsylvania Power & Light in that area. After holding a variety of operating positions, in 1935 he was named assistant to the superintendent of system operation. From 1940 until 1943, he worked on special studies, and became assistant to the superintendent of operation, devoting all his time to wage negotiations and related employee matters.

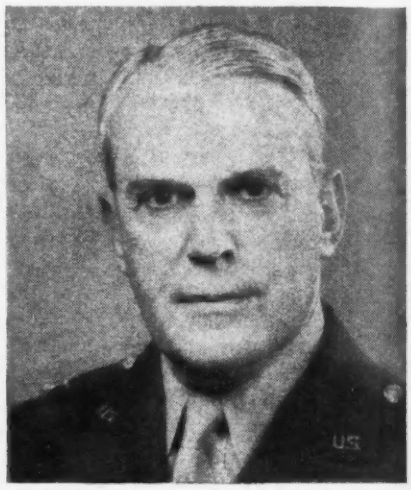
▶ CARL L. RICHEY, Sacramento, has been appointed administrative officer of the Sacramento Municipal Utility District. He will aid in the organization of a staff to operate electric utility properties in the area when the district acquires the system from the Pacific Gas & Electric Co. January 1. Until 1943, when he enlisted in the navy, Mr. Richey was employed for nine years by the Tennessee Valley Authority. He was released from service last year with the rank of lieutenant commander. Since that time Mr. Richey has been making a salary and wage study for the state personnel board.

▶ ARTHUR W. CARPENTER, manager of the testing laboratories of the B. F. Goodrich Co., Akron, Ohio, has been elected president of the American Society for Testing Materials. Mr. Carpenter had been vice-president, and for the past 18 years had been secretary of the society's committee on rubber products. He has also served on the administrative committee on papers and publications, and on the executive committee from 1931 to 1933 and from 1941 to 1943. During the war he was a consultant on WPB.

▶ G. WAYNE WELSCH, of Sciota, Ill. has been elected president of the Association of Illinois Electric Cooperatives. He succeeds Robert Schweickhardt of Dow.

Armstrong Joins ASA Staff; Terminates Army Career

Announcement has been made of the appointment of General Donald Armstrong to the staff of the American



GENERAL ARMSTRONG

Standards Association. General Armstrong, who has just retired from the Army after 36 years' service, will assist Howard Coonley, chairman of the ASA executive committee, in expanding and developing the activities of the ASA. He will also help Mr. Coonley in arranging for an adequate budget to enable ASA to fulfill the enlarged responsibilities which the policy Committee on Standards, under the chairmanship of Charles E. Wilson, agreed with Secretary of Commerce Henry Wallace that the ASA should undertake.

General Armstrong's experience in the Ordnance Department as chief of maintenance, Office Chief of Ordnance, as executive officer and chief of the Chicago Ordnance District, and as commanding general of the Ordnance Replacement Training Center at Aberdeen, Md., gives him an exceptionally fine background for the ASA.

He was graduated from Columbia University in 1909. For several years he served as professional lecturer in the Classics Department of George Washington University. His Army career started in 1910. General Armstrong is a member of the American Association for the Advancement of Science, the Newcomen Society and is a fellow of the Royal Society of Arts. He is also pres-

ent of the American Military Institute
d of the District of Columbia Post,
my Ordnance Association.

•

apt. Walter L. Rubel Joins Staff of Guy B. Panero

Captain Walter L. Rubel, USNR, who
s on the staff of the Production Offi-
r at the New York Naval Shipyard
til his separation from the service last
nth, has joined the firm of Guy B.
nero, successor to Clyde R. Place,
nsulting engineers, as an associate in
rge of the industrial and power divi-
n.

As shop superintendent in the produc-
n department at the Naval Shipyard
generally known as the Brooklyn
vy Yard—Captain Rubel headed an
anization that included 48,000 civil-
employees prior to V-J Day. The de-
rtment manufactured structural and
chanical components used in ship
nstruction, among them turbines,
sel engine parts, castings and many
er items of Naval equipment.

Recalled to active duty in 1940, Cap-
n Rubel was responsible for organiz-

pt. W. L. Rubel

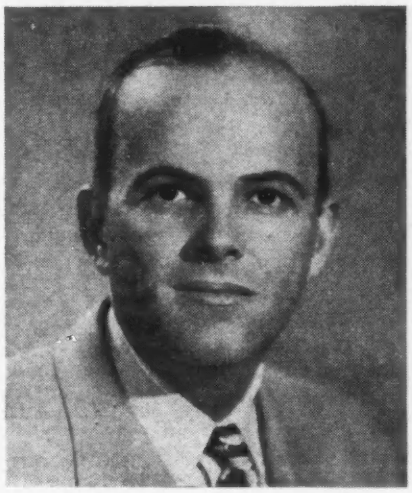
and placing into operation the 92-
e former Alcoa aluminum plant that
forms the Maspeth Annex to the
w York Naval Shipyard.

The firm which Captain Rubel has
ed is one of the leading engineering
anizations in the New York area and
recently purchased by Guy B.
nero from the estate of the late Clyde
Place.

Following service in World War I,
ptain Rubel was in the power plant
ineering department of Sanderson &
ter and later he was chief engineer
he Memco Engineering & Manufac-
ng Co., builders of high voltage elec-
equipment. He is a member of the
E.E.

P. G. Strom Directs Rural Activities of A. S. & W. Co.

American Steel & Wire Co. has announced expansion of its agriculture extension activities and appointment of Paul G. Strom as supervisor of agricultural extension. Mr. Strom has had wide experience in farm management and with the U. S. Department of Agriculture.



P. G. Strom

In announcing the appointment of Mr. Strom, Wilmer H. Cordes, manager of sales research and promotion, stated the agriculture extension department will function as a service to farmers, with particular emphasis on assisting them in agricultural uses of products made by the company. He will work closely with state agricultural colleges, farm bureaus, the Department of Agriculture, 4-H Clubs, livestock associations and county agents.

Before entering military service, from which he was recently discharged, Mr. Strom had been connected with the State Highway Department in Minnesota, the U. S. Department of Agriculture and the Union Central Life Insurance Co.

OBITUARY

► Thomas W. Peters, formerly district manager of the Potomac Edison Co., at Cumberland, Md., died of a heart ailment at his home in that city on September 5. He was 61 years of age.

► Willis Ishler, 68, a transformer engineer who had been with General Electric Co. for 45 years until his retirement last spring, died at Pittsfield, Mass., on August 24. He was a graduate of Pennsylvania State College, and was located at the company's Lynn Works from 1901 to 1907, after which he was employed at the Pittsfield factory, specializing in distribution transformer engineering.

► James E. Macdonald, who was secretary of the Los Angeles Joint Pole Committee from its organization in 1907 to his retirement in 1940, died on August 8. Mr. Macdonald became secretary of the committee upon its organization in 1907. The committee's original membership comprised four railways and three electric companies, which were the formulators of an agreement known as the Joint Pole Agreement of October 10, 1906, to bring about the common use of poles on a joint ownership basis. The two telephone companies then operating in Los Angeles followed a short time later in becoming parties to this agreement. Due largely to his efforts, the committee's membership had grown at his retirement to 28 utilities, embracing in scope of operation practically all of southern California and a large part of the San Joaquin Valley. Before joining the committee, Mr. Macdonald had been electrical engineer with the Pacific Electric Railway Co. He was born in New Glasgow, Nova Scotia, in 1874 and was a graduate of McGill University, Montreal. Prior to his retirement he had been active in several engineering societies and was a past-president of the Los Angeles section of the A.I.E.E.

► Burdett Moody, retired executive of the Los Angeles Department of Water & Power, died at his home early in September. He was 80 years old. Mr. Moody had been with the department 26 years when he left in 1940. He was born in Yankton, S. D., and was graduated from the Massachusetts Institute of Technology. Before going to Los Angeles he had been employed by the city of San Francisco and the city of Pasadena. At the time of his retirement he was head of the business agents division of the department, a group devoted to promoting the extended use of electrical power.

► Albert N. Bright, 60, president of the Haselton Electric Co., Hartford, Conn., died at Wethersfield, Conn., on September 7. He was a native of Thompsonville, Conn.

► Thomas McNiff, 76, for nearly 56 years employed by the Brown & Sharpe Mfg. Co., Providence, R. I., and traffic manager and purchasing agent until his retirement in 1941, died at Providence on September 9. In 1935 he received a half-century service pin from the company, being one of but a handful of men to hold such an award at that time.

SEC RULINGS

The Securities and Exchange Commission recently issued a series of orders affecting electric utility companies.

CONSUMERS POWER Co.'s proposal to undertake a refinancing program has been approved. The company is a subsidiary of Commonwealth & Southern Corp. The company plans to increase authorized number of no par common shares from 2,000,000 to 6,000,000 and will issue 3,623,432 of the reclassified common to parent in exchange for the 1,811,716 of company common now held by parent. (Release No. 6871).

GENERAL PUBLIC UTILITIES CORP.'s proposal to issue up to $6,250,000 of unsecured promissory notes and use the proceeds with Treasury funds to redeem about $8,200,000 of 4¼ percent convertible debentures has been approved. The commission ruled that the use of $2,000,000 of Treasury funds in the redemption program was necessary to simplify the declarant's holding company system. The unsecured notes are to be sold to four banks. The interest rate on the notes maturing not more than five years after issuance will be 1½ percent, and on the notes maturing thereafter will be 2 percent. SEC directed that the redemption of the convertible debentures be effected in such a manner as to preserve for the holders of the 8-yr. 8 percent gold bonds due in 1940 of the Associated Gas & Electric Corp. not exchanged for convertible debentures the amount which they might have realized by virtue of the convertible right. (Release No. 6870).

NEW JERSEY POWER & LIGHT CO.'s case, involving the purchase of its gas system, will again go before the commission, which has ordered a reconvened hearing on an application filed by Rena R. Carver, Calvin R. Carver and Doris C. Fearon. These parties have contracted with the utility for the purchase of its gas system and properties for $361,100. They have formed three New Jersey corporations, City Gas Co. of New Jersey, City Gas Co. of Phillipsburg, and the City Gas Co. of Newton, to take title to New Jersey Power's gas properties. (Release No. 6875).

REPUBLIC SERVICE CORP.'s request for an extension to September 15, of time to file an amendment to recapitalization plan in accordance with the commission's findings and opinion of August 1, has been granted. At that time the commission rejected alternative plans filed by the company and I. H. Isaac, a preferred stockholder, but gave both parties 30 days to file modifications. SEC suggested that a capital structure consisting of $1,000,000 or less of debt and new common stock would meet requirements of the Holding Company Act. (Release No. 6868).

ILLINOIS POWER CO. has been authorized to sell its electric utility assets located in and adjacent to Mound City, Ill., to Mound City Water & Light Co., for $125,000 in cash, which consideration includes an unallocated amount applicable to the sale of Illinois Power Co.'s water supply assets in Mound City, Ill., as part of the same transaction.

P.U.A.A. Planning Regional Meetings for Coming Year

Plans are being formulated by the Public Utilities Advertising Association to hold area and regional meetings for the purpose of discussing advertising and publicity problems. It is hoped to have at least one, and in most regions two, meetings during the 1946-1947 year. In addition one meeting of a national convention caliber is projected for each area.

The objective of the program is to strengthen the work of the association by affording its members and those allied with them in advertising and related activities for utility companies. the opportunity to get together and cuss pertinent problems. Last year program was under the direction Harold S. Metcalfe, West Penn P Co., vice-president of PUAA, and organizing the program this year.

•

Ocala, Fla., Will Buy Pow

Because of rising construction material costs, Ocala (Fla.) City C cil has deemed it advisable to defer struction of a municipal plant an sign a five-year contract with the Flo Power Corp. for power to be re through its municipal distribution tem.

MEETINGS

Edison Electric Institute—Meter and service committee, Hotel Roosevelt, New Orleans, La., October 1-3; prime movers committee, Hotel Roosevelt, New Orleans, La., October 6-7; accident prevention committee, Hotel Statler, Buffalo, N. Y., October 31-November 1. Col. H. S. Bennion, managing director, 420 Lexington Ave., New York 17, N. Y.

National Exposition of Power and Mechanical Engineering—Grand Central Palace, New York, N. Y., December 2-7.

Previously Listed

International Association of Electrical Inspectors—Northwestern Section, Boise Hotel, Boise, Idaho, September 23-25; W. L. Gaffney, secretary, 408 City Hall, Tacoma 2, Wash. Southwestern Section, Hotel Sacramento, Sacramento, Calif., September 30-October 2; H. L. Gerber, secretary, 205 City Hall, San Francisco, Calif., Southern Section, George Vanderbilt Hotel, Asheville, N. C., October 14-16; A. M. Miller, secretary, 910 W. 30th St., Richmond 24; Va. Western Section, Gibson Hotel, Cincinnati, Ohio, October 21-23; F. H. Moore, secretary, 320 N. Meridian St., Indianapolis 9, Ind. Eastern Section, Mark Twain Hotel, Elmira, N. Y., October 28-30; F. N. M. Squires, secretary, 85 John St., New York 7, N. Y.

Indiana Electric Association—French Lick Springs Hotel, French Lick, Ind., September 25-27. E. F. Hauser, secretary, 1414 Circle Tower, Indianapolis, Ind.

Municipal Electric Utilities Assoctation of New York State—Annual conference, Mark Twain Hotel, Elmira, N. Y., September 25-27. T. J. McKee, secretary, 200-212 E. Third St., Jamestown, N. Y.

American Society of Mechanical Engineers—Fall meeting, Statler Hotel, Boston, Mass., September 30-October 2. Ernest Hartford, executive assistant secretary, 29 W. 39th St., New York 18, N. Y.

Pennsylvania Electric Association — Annual meeting, Wm. Penn Hotel, Pittsburgh, Pa., October 1-2. A. B. Millar, managing director, State St. Bldg., Harrisburg, Pa. Electrical equipment committee, Lord Baltimore Hotel, Baltimore, Md., October 24-25; B. E. Hagy, chairman, Philadelphia Electric Co., 900 Sansom St., Philadelphia 5, Pa. Transmission and distribution committee, Abraham Lincoln Hotel, Reading, Pa., October 24-25; C. C. Farrell, vice-chairman, Philadelphia Electric Co., 900 Sansom St., Philadelphia, 5, Pa. Meter committee, Benjamin Franklin Hotel, Philadelphia, Pa., November 7-8. R. A. Black, chairman, West Penn Power Co., Connellsville, Pa. Systems operation committee, Skytop Lodge, Pa., November 7-8; A. R. Deck, chairman, Metropolitan Edison Co., Reading, Pa.

International Association of Electrical Leagues—Annual conference. Astor Hotel, New York, N. Y., October 2-4. O. C. Small, secretary, 155 E. 44th St., New York 17, N. Y.

Southeastern Electric Exchange—Engineering and Operation Section, Henry Grady Hotel, Atlanta, Ga., October 3-4; Accounting Section, Sumter Hotel, Charleston, S. C., October 1 Commercial Section, Atlanta Biltmore H Atlanta, Ga., November 6-9. J. W. T executive secretary, 303 Haas-Howell Bldg., lanta 1, Ga.

National Electronic Conference—Second a conference, Edgewater Beach Hotel, Chi Ill., October 3-5. E. H. Schulz, secr Illinois Institute of Technology, 3300 S. Fi St., Chicago 16, Ill.

Edison Electric Institute — Electrical equi committee, New Ocean House, Swamp Mass., October 4-5; transmission and di tion committee, Cavalier Hotel, Virginia Va., October 7-8. Col. H. S. Bennion, ma ing director, 420 Lexington Ave., New Yor N. Y.

American Institute of Electrical Engineers—G Lakes District, Claypool Hotel, Indian Ind., October 9-11. H. H. Henline, secr 33 W. 39th St., New York 18, N. Y.

National Electrical Contractors Association—A nual meeting, Ritz Carlton Hotel, Atlantic C N. J., October 14-18. C. J. Harder, nat secretary, 633 Investment Bldg., Washing D. C.

Electrochemical Society—Fall meeting, Roya Hotel, Toronto, Canada, October 16-19. C G. Fink, secretary, Columbia University Broadway, New York 27, N. Y.

ASME-AIME Joint Fuels Conference — Bel Stratford Hotel, Philadelphia, Pa., Oct 24-25. A. W. Grosvenor, c/o Drexel Institu Technology, Philadelphia, Pa.

American Welding Society—Annual meeting, York, N. Y., October 24, and Atlantic C N. J., November 17-22. M. M. Kelly, secr 33 W. 39th St., New York 18, N. Y.

RLM Standards Institute—Annual meeting, ton Hotel, Atlantic City, N. J., October

National Electrical Manufacturers Associa—Annual meeting, Traymore Hotel, Atlantic C N. J., October 28-November 1. W. J. D managing director, 155 E. 44th St., New Yo N. Y.

National Farm Electrification Conference—Sh man Hotel, Chicago, Ill., November 7-8. Kable, chairman, *Electricity on the Farm*, 40th St., New York 18, N. Y.

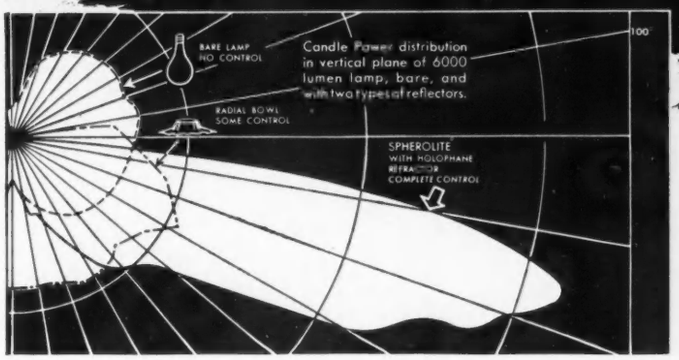
National Research Council—Conference on trical Insulation, Johns-Hopkins University timore, Md., November 7-9. W. F. Da chairman, Consolidated Edison Co. of New Inc., 4 Irving Place, New York, N. Y.

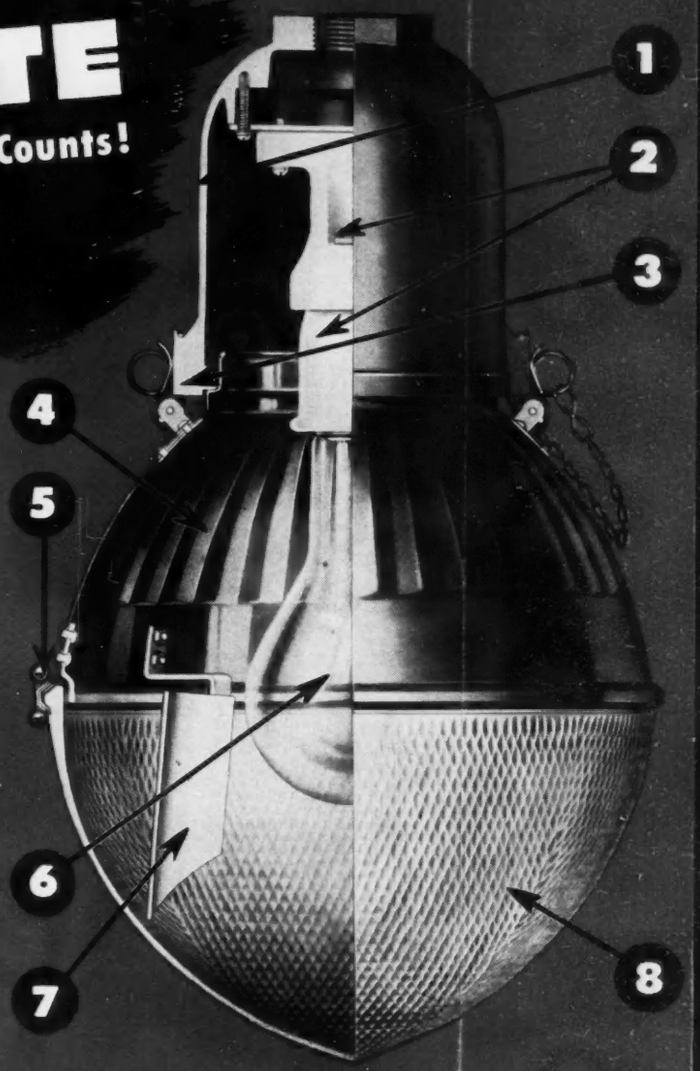
National Association of Railroad and U Commissioners—Annual meeting, New O La., November 12-15. Ben Smart, sec 7411 New Post Office Bldg., Washington,

New Jersey Utilities Association—Annual m Seaview Country Club, Absecon, N. J., ber 22-23. Harry Bacharach executive d Atlantic City, N. J.

L-M SPHEROLITE

Gives Greater Visibility Where It Counts!


BARE LAMP NO CONTROL
Candle Power distribution in vertical plane of 6000 lumen lamp, bare, and with two types of reflectors.
100
RADIAL BOWL SOME CONTROL
SPHEROLITE WITH HOLOPHANE REFRACTOR COMPLETE CONTROL



L-M Spherolite makes the best use of all the light, because its scientific design controls the light in both horizontal and vertical planes. Spherolite distributes the light uniformly over a wide area instead of wasting it beneath the luminaire or above the horizontal.

The chart above shows how the combination of the Alzak aluminum reflector and the Holophane refractor "aims" the light in the desired direction. If an asymmetric light pattern is required, the pattern of light can be redirected laterally to give increased intensity where it is desired.

Ask about L-M Illuminating Engineering Service . . . Line Material Company's staff of experienced, well-trained lighting engineers will suggest and plan street lighting systems for *you*. These men will draft complete, detailed plans for any street lighting project, whether it be an integrated system for an entire town, or a special installation to meet unusual requirements. This valuable engineering service is yours without cost or obligation. The L-M field engineer in your vicinity will be glad to make the arrangements if you wish to have a plan submitted for your consideration.

L-M also offers you a series of twelve technical bulletins on Street Lighting Fundamentals. One or all of these bulletins are available to you for the asking. A complete list of titles is given below.

Contact your L-M field engineer today, or write direct to Line Material Company, Milwaukee 1, Wisconsin, for further details on the Spherolite street-lighting method.

Topics of Street Lighting Fundamentals

Development of Modern Street Lighting

Why Prismatic Reflectors Offer Greater Efficiency

Controlled Light Patterns and Their Uses

Reading Isolux Charts

Reading Utilization Efficiency Charts

Selection of Mounting Height and Spacing

Transverse Locations of Luminaires

Recommended Illumination for Safety

Street Lighting Installation Practice

Control of Multiple and Series Systems in Outdoor Illuminations

Use of Control Equipment for Special Lighting Applications

Lighting Requirements for Wide Streets and Boulevards

Cost-Cutting Features of Spherolite

1. **All-metal Hood:** die-cast aluminum; provides ample space for wiring.

2. **Receptacle and Socket:** wet process porcelain; rugged, silver-plated contacts and current-carrying parts.

3. **Toggle Latch:** fastens reflector firmly to hood.

4. **Reflector:** Alzak Aluminum, scientifically fluted to insure accurate light control.

5. **V-band Holder:** one of three types of holders available. Provides permanent seal between glassware and reflector, but 2 screws can be loosened to replace glassware in the field.

6. **Light Source:** concealed to reduce disturbing, dangerous glare.

7. **Deflector:** specular aluminum, used in connection with asymmetric light distribution.

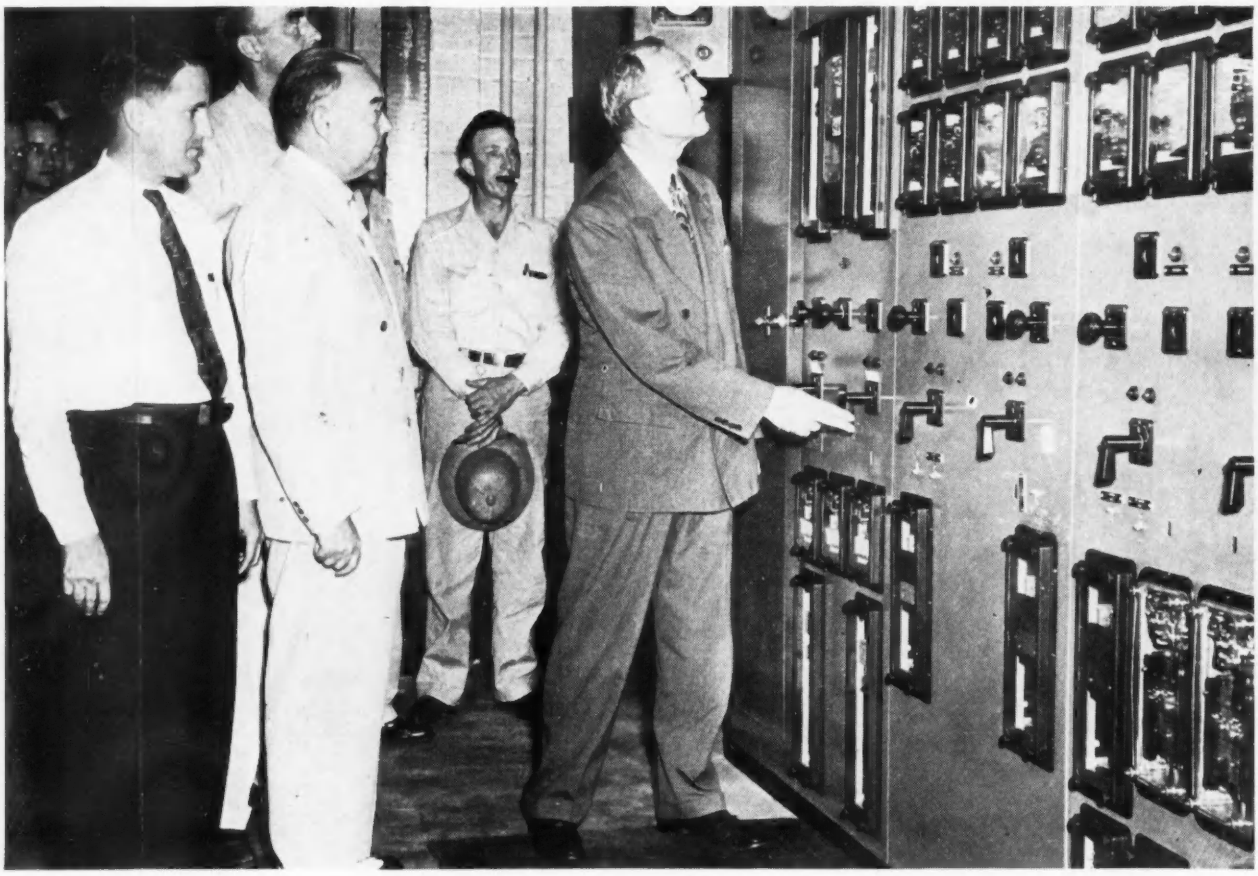
8. **Holophane Refractor:** lateral one-piece, self-cleaning L-M diamond mesh pattern.

LINE MATERIAL

STREET LIGHTING EQUIPMENT

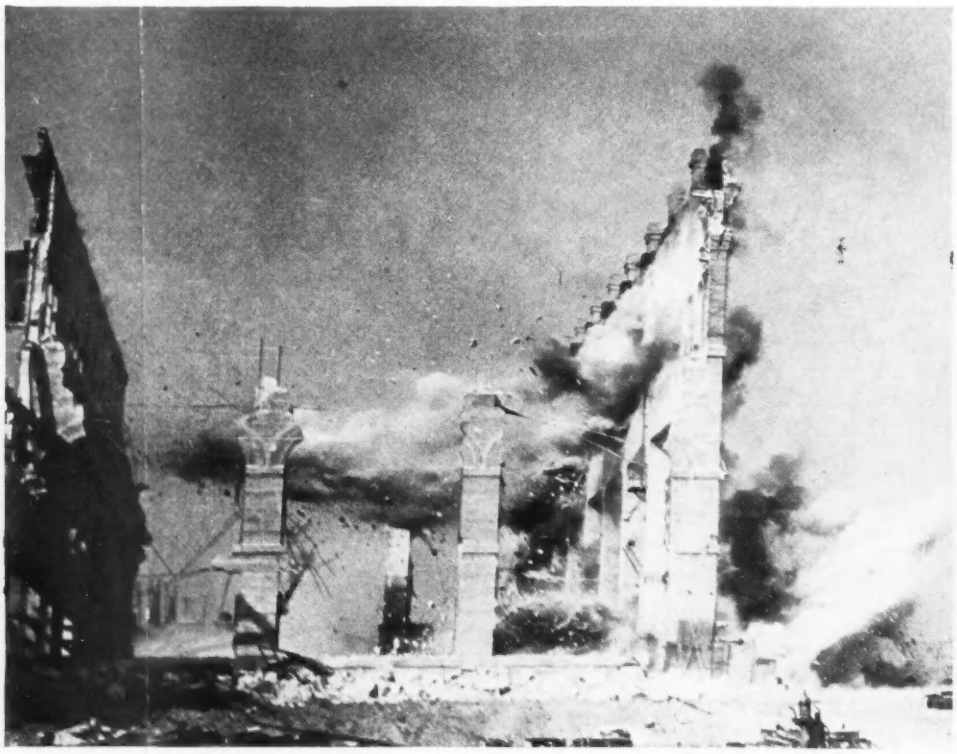
L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Sub-Station Equipment

THE INDUSTRY IN PICTURES



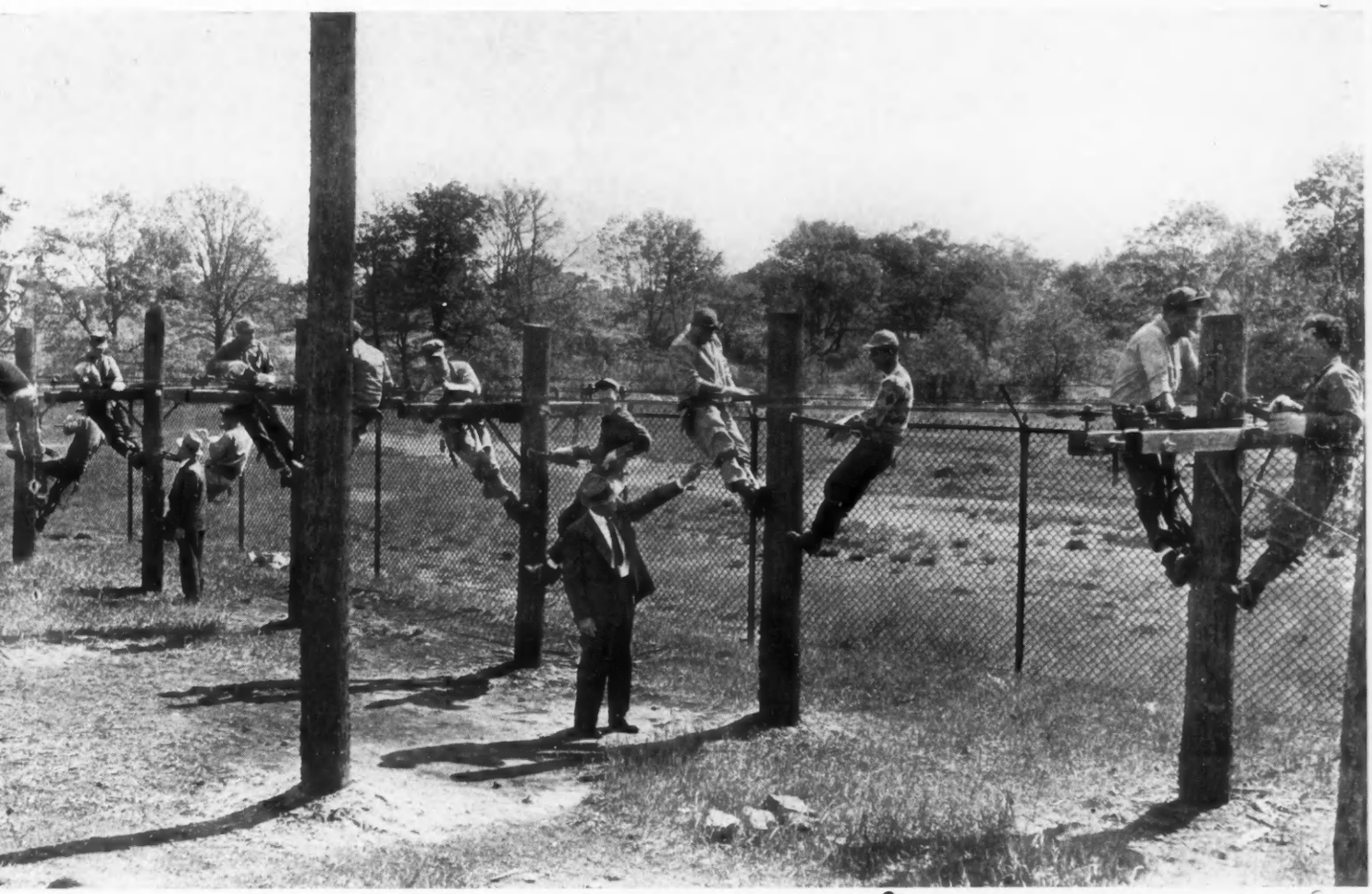
NEW POWER LINK—William E. Mitchell, president of Georgia Power Co., in the presence of company officials at the Boulevard substation, cuts in the new oilostatic cable which completes the 110-kv. circuit around Atlanta

UP THE POLE, B
on 10-ft. poles. A



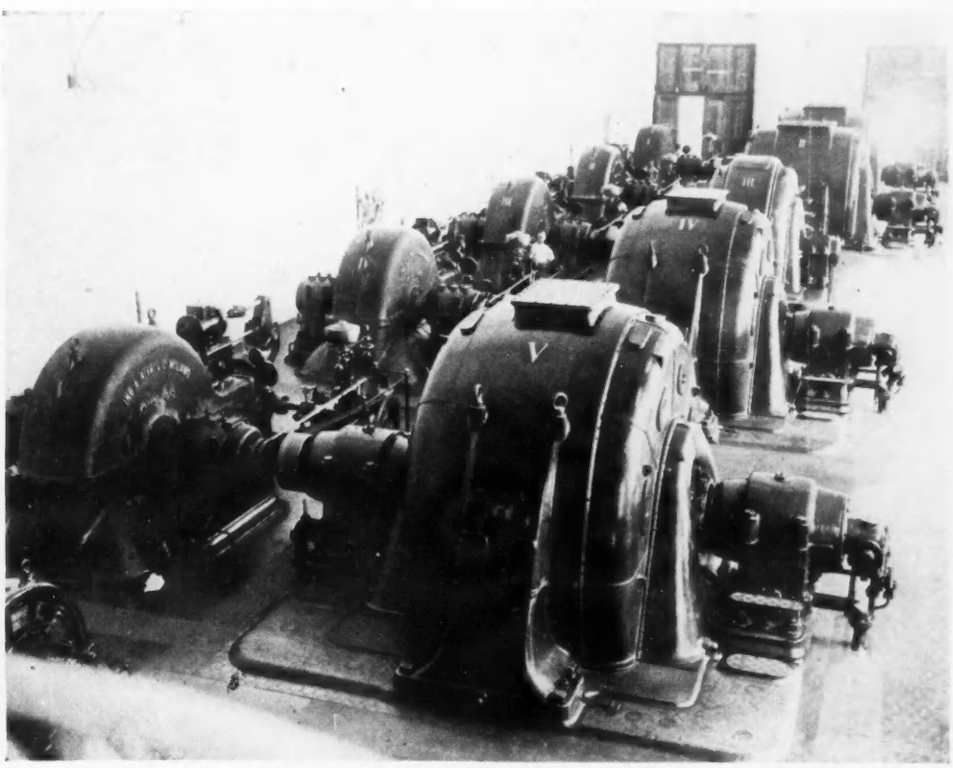
ELIMINATING THE OLD—The south wall of the long unused Redondo Beach steam plant of Southern California Edison Co. crumbles under explosives

TEEN-AGERS FAVOR ELECTRIC COOKING—the Reddy Kilowatt cooking school conducted



OLE, BUT UP ISN'T FAR—A group of students in the training school of the Narragansett Electric Co., Providence, R. I., get their first lessons les. As they become more experienced, they will be advanced to 20-ft. poles. Safety Supervisor J. H. Smith is in charge

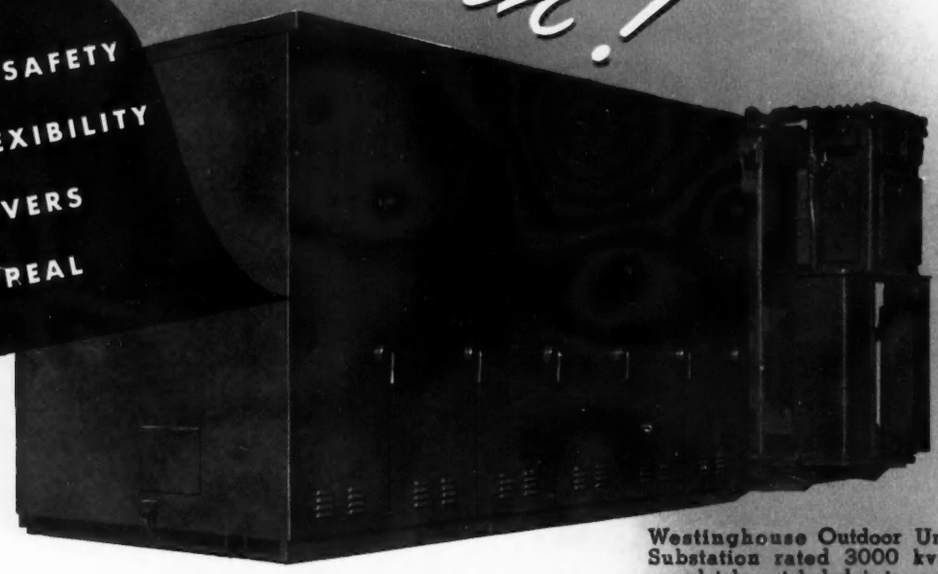
OKING—One of the five classes graduating from nducted b Ohio Public Service Co.



THE FRENCH WANT IT—This power plant near Tenda, Italy, will come under control of France if the Paris Peace Conference gives its approval

ALL 4 ARE *Built-in!*

- OPERATING SAFETY
- SYSTEM FLEXIBILITY
- SPACE SAVERS
- EYE-APPEAL



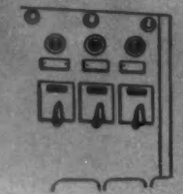
Westinghouse Outdoor Unit Substation rated 3000 kva, completely metal-clad, is tamper-proof and safe in any suburban location.

WHEN YOU SPECIFY WESTINGHOUSE UNIT SUBSTATIONS

More and more power companies are installing Westinghouse Unit Substations because they meet these four basic requirements of the modern substation—with fully built-in features:

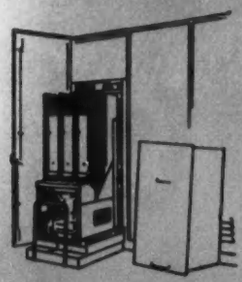
1. **Safety of operation and maintenance**—assured by removable breakers, steel barriers, positive interlocking, "De-ion" arc interruption, insulated busses, loading-by-copper temperature (makes full transformer thermal capacity safely available).
2. **System flexibility**—provided by interchangeable, "Unitized" switchgear units, allowing additional feeder units to be applied simply. Unit capacities can be selected to meet existing needs, yet provide for expansion.
3. **Compactness**—twice the capacity of conventional open substations in half the space lowers real estate costs and permits location in areas otherwise unavailable for substation use.
4. **Modern appearance**—close-coupled throat connection, with units of uniform height, gives the "eye-appeal" so important in residential areas.

These and other reasons—mobility . . . versatility of application . . . the advantages of "Unitized" switchgear . . . make Westinghouse Unit Substations the answer in distribution planning. For complete information, call your Westinghouse office, or write for B-3238 to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-97119



• Loading-by-copper temperature makes full thermal capacity of transformer safely available.

• No costly structure loss—entire substation can be easily moved to new location.



• Breaker is removable—in minutes—with full safety to operator.

• Minimum installation time and over-all cost.

For Single Feeder Substations—the last word in "Packaged Power"—the Westinghouse CSP Power Transformer performs all functions of a conventional substation.

Westinghouse UNIT SUBSTATIONS

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Oklahoma Utility Leases Controversial Ark-La Line

Arkansas Public Service Commission has authorized Oklahoma Gas & Electric Co. to construct a 110- to 66-kv. substation at a cost of about $110,000 to furnish additional power supply for Fort Smith, Ark. O. G. & E. reported it had a lease on the much publicized Ark-La Electric Co-op line from Grand River Dam in Oklahoma to Fort Smith to transmit power from the dam to the new substation for distribution to Fort Smith.

The Ark-La line has been out of use since the Jones Mill Aluminum plant which it served at Lake Catherine, Ark., was closed down after the end of the war. It is under supervision of Southwest Power Administration, which plans to utilize it in integrating Norfork Dam in Arkansas with Grand River Dam in Oklahoma, with part of the $7,500,000 appropriation granted by Congress recently. What arrangements O. G. & E. will make after then was not revealed.

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Signs for BPA Power

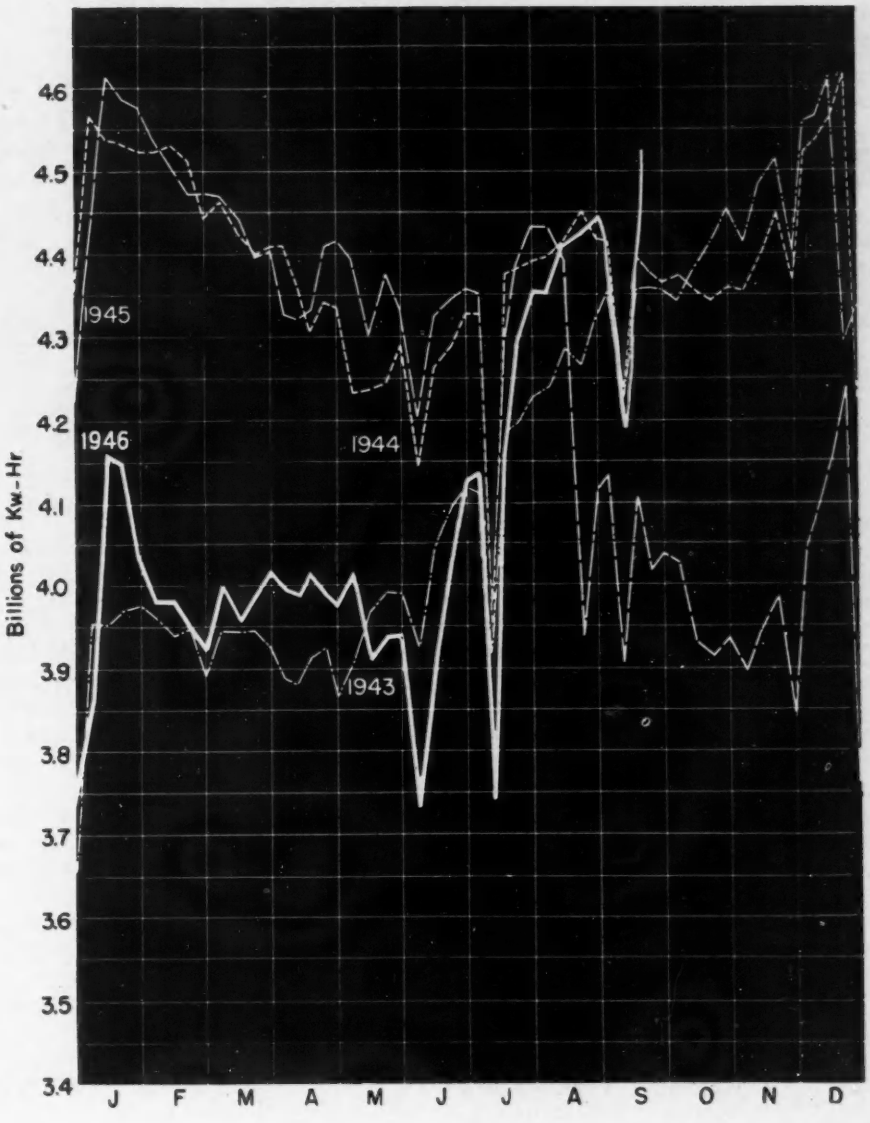
Engene, Ore., has concluded a 20-year contract with Bonneville Power Administration for purchase of a minimum of 1,000 kw. of firm power, D. L. Marlett, acting Bonneville administrator, announced. The new contract replaces an interchange agreement of August, 1940.

Under the new contract, the city may purchase additional power when necessary to meet growing requirements of the municipal distribution system. The agreement also provides for sale upon request of available dump energy at 2.5 mills a kw.-hr. to either the city or the administration.

UTILITY REPORTS

	Net Income 1946	1945
*American Gas & Electric and subs	$15,965,944	$12,453,718
*California Electric Power and subs	1,380,148	1,339,397
‡Central Maine Power	3,345,095	3,120,149
†Electric Power & Light and subs	15,371,514	11,801,756
*Engineers Public Service and subs	7,498,984	7,459,038
†Oklahoma Gas & Electric	3,249,957	2,421,845
†Pennsylvania Power & Light	3,849,651	2,266,474
*Southwestern Public Service	1,767,738	1,577,797
†Standard Gas & Electric and subs	4,888,666	5,115,097
*Tampa Electric	1,476,006	1,244,621
*Virginia Electric & Power	6,299,850	6,427,957

‡ Twelve months ended August 31.
* Twelve months ended July 31.
† Twelve months ended June 30.



Output Hits Record High for September

Recovering the ground lost during the week ended September 7, containing the Labor Day Holiday, the electric output curve swung sharply upward during the week ended September 14, reaching a record high, not only for September, 1946, but for September in previous years. The amount of electrical energy distributed by the light and power industry during the week totaled 4,521,151,000 kw.-hr., compared with 4,184,404,000 kw.-hr. during the preceding week, according to figures released by the Edison Electric Institute. The amount of electrical energy distributed during the corresponding week of 1945, that of September 15, amounted to 4,106,187,000 kw.-hr., this year's figure representing an increase of 10.1 percent.

The Pacific States, which showed a gain of 4.6 percent for the week ended September 7, reported an increase of 10.9 percent for the week ended September 14.

Weekly Output, Millions Kw.-Hr.

1946		1945		1944	
Sept. 14	4,521	Sept. 15	4,106	Sept. 16	4,395
Sept. 7	4,184	Sept. 8	3,909	Sept. 9	4,228
Aug. 31	4,404	Sept. 1	4,137	Sept. 2	4,415
Aug. 24	4,444	Aug. 25	4,116	Aug. 26	4,418
Aug. 17	4,422	Aug. 18	3,939	Aug. 19	4,451
Aug. 10	4,412	Aug. 11	4,395	Aug. 12	4,415
Aug. 3	4,351	Aug. 4	4,432	Aug. 5	4,399
July 27	4,352	July 28	4,435	July 29	4,391
July 20	4,293	July 21	4,385	July 22	4,381
July 13	4,156	July 14	4,295	July 15	4,377
July 6	3,741	July 7	3,978	July 8	3,941
June 28	4,133	June 30	4,353	July 1	4,327
June 22	4,129	June 23	4,358	June 24	4,325

Percent Change from Previous Year

	Sept. 14	Sept. 7	Aug. 31
New England	+ 7.8	+10.9	+ 9.4
Mid-Atlantic	+ 6.7	+ 6.3	+ 5.8
Central Industrial	+11.8	+ 9.2	+ 8.6
West Central	+ 9.3	+ 7.1	+ 7.3
Southern States	+12.4	+ 7.1	+ 7.0
Rocky Mountain	+ 2.3	+ 0.6	+ 0.4
Pacific Coast	+10.9	+ 4.6	+ 3.5
Total United States	+10.1	+ 7.0	+ 6.5

New Fractional Horsepower Motor Standards Announced By NEMA

New Standards Provide Specific Definitions of Motor Ratings and Performance in Coordinated Terms of Hp. Ratings, Speed, Breakdown Torque, and Service Factor

A BROAD new program of standardization for fractional horsepower motors, designed to reduce production costs, insure efficiency and proper application in use, and result in long term savings to customers, was announced last week by members of the motor and generator section of the National Electrical Manufacturers Association.

The new standards provide specific definitions of motor rating and performance in coordinated terms of horsepower rating, speed, breakdown torque, and service factor. In formulating the new standards, the motor manufacturers felt that a clearly defined and generally accepted method of evaluating motor performance was essential in order to assure intelligent design, manufacture and use of small power motors. The fundamental points covered in the standards include not only this new basis of rating, but also previously standardized locked rotor or starting currents of motors. It was emphasized that this was but the first phase in the new program of standardization, and would be followed later this year by other items of standardization such as dimensions, and application standards for hermetically sealed motors, belt drive refrigeration compressor motors, washing machine, stoker, oil burner, belted fan and blower motors, shaft mounted fans and blowers, cellar drainer, gasoline pump and jet pump motors.

In the new standards, small power single-phase motors are rated primarily on the basis of breakdown torque. In order that the standards be inclusive and serve to provide a definition of rating of any particular motor design the complete range of breakdown torque was divided into bands for various standard horsepower ratings. Such a series of torque values associated with corresponding hp. rating provides a definite classification of any motor in terms of horsepower rating as shown in Table I.

The service factors adopted as part of the new standards are given in Table II. These factors recognize the inherent 10 deg. C. margin of safety built into the motor and define the loading that will give a total temperature rise of 50 deg. C. on a general purpose motor having 40 deg. C. rise on the name plate rating. The standards also list code letters to designate the starting current in terms of "locked KVA per horsepower" as indicated in Table III.

The value of standardization as a key factor in obtaining performance interchangeably in application and maximum production efficiency has been recognized by motor manufacturers virtually since the inception of the business, according to L. C. Spoor, of Chicago, vice-chairman of the fractional horsepower subdivision of the motor and generator section of NEMA. Standardization in the general motor field was initiated as early as 1908, he continued, and over a period of years has proved to be a powerful factor in establishing high quality products and reducing over-all costs.

One example, he said, was the case of motors made for washing machine manufacturers where through effective standardization, prices were reduced more than 50 percent between 1923 and

Table II—Service Factor for General Purpose 40° C. Induction Motors

Rated Hp.	Service Factors
1/20	1.4
1/12	1.4
1/8	1.4
1/6	1.35
1/4	1.35
1/3	1.35
1/2	1.25
3/4	1.25
1 at 3,600 Rpm. only	1.25

Table III

Code Letter	Kva. per Hp.
A	0 - 3.15
B	3.15 - 3.55
C	3.55 - 4.0
D	4.0 - 4.5
E	4.5 - 5.0
F	5.0 - 5.6
G	5.6 - 6.3
H	6.3 - 7.1
J	7.1 - 8.0
K	8.0 - 9.0
L	9.0 - 10.0
M	10.0 - 11.2
N	11.2 - 12.5
P	12.5 - 14.0
R	14.0 - and up

Table IV—Locked Motor Current

Rated Hp.	Amp. 115-v.	Amp. 230-v.
1/6 and smaller	20	10
1/4	23	11.5
1/3	31	15.5
1/2	45	22.5
3/4	61	30.5

NEMA FRACTIONAL HORSEPOWER MOTOR TABLES

Table I—Horsepower Rating in Terms of Breakdown Torque

3,600 3,450	3,000 2,850	1,800 1,725	1,500 1,425	1,200 1,140	900 850	Synchronous Rpm. Approx. F. L. Rpm.
		Breakdown Torque Oz.-Ft.				Brake Hp. Rating
2.0- 3.7	2.4- 4.4	4.0- 7.1	4.8- 8.5	6.0-10.4	8.0-13.5	1/20
3.7- 6.0	4.4- 7.2	7.1-11.5	8.5-13.8	10.4-16.5	13.5-21.5	1/12
6.0- 8.7	7.2-10.5	11.5-16.5	13.8-19.8	16.5-24.1	21.5-31.5	1/8
8.7-11.5	10.5-13.8	16.5-21.5	19.8-25.8	24.1-31.5	31.5-40.5	1/6
11.5-16.5	13.8-19.8	21.5-31.5	25.8-37.8	31.5-44.0	40.5-58.0	1/4
16.5-21.5	19.8-25.8	31.5-40.5	37.8-48.5	44.0-58.0	58.0-77.0	1/3
21.5-31.5	25.8-37.8	40.5-58.0	48.5-69.5	58.0-82.5	.....	1/2
31.5-44.0	37.8-53.0	58.0-82.5	69.5-99.0	.....	.....	3/4
44.0-58.0	53.0-69.5	.....	.....	.....	.....	1

1941, while the volume of standard motors produced was increased several times.

He pointed out that during the war the demand for small motors showed a phenomenal increase, and that the backlog of demand was among the heaviest of all electrical products. Prior to the all-time peak demand brought on by the war and the existing need for appliances, many special lines of motor were built according to individual specifications, resulting in multiplicity in design and confusion in application, which tended to reduce quantity output compared to that which might be produced under a broad plan of standardization. The tremendous shortage of motors was one of the determining factors, Mr. Spoor said, in developing standards which would facilitate maximum output.

In the past, Mr. Spoor pointed out, the horsepower stamped on a fractional horsepower motor plate has not always been a true indication of the motor's load carrying ability since no adequate standard had previously been established to define horsepower rating in terms of speed and torque. Because of this lack of uniformity in rating, the motor of one manufacturer might drive a machine while a motor of the same type and horsepower rating of another manufacturer might fail to operate it satisfactorily. The manufacturer who used small power motors as a component of his product was constantly required to test each manufacturer's motors on his device in order to determine their suitability. These new standards should obviate these difficulties.

In formulating these standards, careful attention was also given, Mr. Spoor said, to factors which would permit selection of proper control equipment and wiring. Effort has likewise been made to define the standards in terms which would afford maximum freedom in design progress and to establish values conforming closely to present terms, products, and practices.

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Electrical Union Vote Allows Communists to Lead

The United Electrical Workers Union (C.I.O.) at the Milwaukee convention last week voted by more than four to one to permit members to hold union office regardless of political beliefs, and thereby rejected a minority report which would have barred Communists from office. The vote, 2,839 to 673, accepted the resolution committee majority report which "guarantees every member the right to hold any position in the union."

Asplundh Meeting Emphasizes Public Relations and Wire-Tree Relationship

The art and technique of obtaining better utility-customer relations by obtaining proper wire-tree relationship was the main theme of the Asplundh Tree Expert Co.'s educational meeting held at the Essex House, Newark, N. J., September 12. Approximately 75 utility executives, telephone company officials, and city foresters heard the company experts discuss the relationship between tree trimming and clearance to customer relations, saw movies of future experts in training at the Asplundh school, and saw the latest equipment procured to trim and remove trees.

The relationship of wire to tree on any given system is an indicator of the operating company's public consciousness, stated Ralph I. Kauffman, director of education and training at the Asplundh school. This has always been high, continued Kauffman, but it is happy to see the operating companies striving to raise these standards by obtaining a better understanding of the wire-tree problem and putting these into effect.

To obtain these and put them into practice is not as difficult as some men believe, Kauffman added. It is simply a matter of proper programming of tree trimming operations and proper execution of that plan with adequately trained personnel.

Training is a must for a finished tree man, the educational director told the audience, and for this reason the Asplundh Tree Expert Co. has started a private school at Jenkintown, Pa. Here the students are first taught to identify the various trees found in tree trimming. This, he continued, is of prime importance since the rate of growth and strength of fiber varies with each. The tree must be recognized and the growth rate and fiber strength known before trimming begins, he continued, so that proper clearance can be safely attained without tree mutilation.

"Experience in recognizing types of construction and species of trees encountered should determine whether directional clearance trimming, drop crotching or topping should be used. A tree is a tree regardless of where it stands. To mutilate hampers good public relations; to trim properly betters customer good will. One good point to remember is that public relationships and customer good will run through the trees just as much as do the conductors," he concluded.

Carl Asplundh, in opening the program, discussed the part that the contractor, utility executives and municipal authorities played in obtaining proper and adequate trimming.

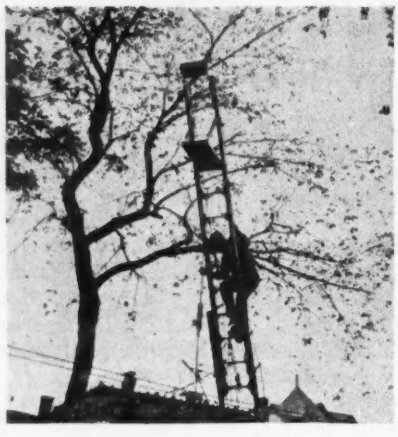
Labor Saving Devices Shown

Immediately following the meeting the new labor saving devices were demonstrated. One of the newest, still in experimental stages, a pneumatic pole clip was utilized in trimming the branches up to 1-in. diameter. The cutting tool is actuated by air from a small portable compressor. It utilizes about 2½ cu. ft. of air at 50 to 90 psi. The "business end" is pushbutton controlled and is counterbalanced by the air chamber on a 10-ft. pole.

Another new device demonstrated was the chipping machine. This device, a regular "log hog," chews debris, leaves and branches up to 6-in. diameter into a sawdust and blows this into the dump part of the truck. The unit is powered by a 6-cylinder Chrysler motor, and makes it possible for the 2½-ton Dodge used to carry the equivalent of 15 normal brush loads.

The time saving and safety features of the Crow's Nest were explained. This unit had a 26-ft. extension ladder and

TIMBER, SAWDUST—Felling the tree (left) before this group of line officials at the Asplundh demonstration was a matter of seconds with the small power saw. After the felling, the tree limbs were chewed to sawdust by the "log hog"



FAST CUTTING—Trimming with the new pneumatic clipper was so rapid that the ladder came in handy. It was up, clip, shift position, clip and then down

was mounted on a 1½ ton-Dodge. Also shown was the chain-driven power saw. By this equipment, the preliminary trimming was done, the tree felled, cut up into convenient lengths, the debris and branches chewed into sawdust and the street cleared in 35 minutes.

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Copper Production Hits New High for Year

August copper production climbed to the highest point in almost a year, according to figures released recently by the Copper Institute, indicating that copper production was nearing peak recovery from strikes that swept the industry during the first half of the year.

Crude production totaled 64,209 tons against the July figure of 56,906 tons. The previous recent high was November, 1945, when crude production was 65,236 tons. Refined production in August totaled 59,591 tons, against the July mark of 43,606 tons. Domestic shipments, including substantial tonnages released by the Office of Metals Reserve climbed to 118,814 tons, against the July figure of 96,826 tons.

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Motor Truck Output

Due mainly to materials shortages, especially in sheet steel and heavy-duty transmissions, International Harvester's total motor truck production in August while greater than in August, 1941, fell below the July total. Total International truck production for the week ending August 31 was 2,817 units, as compared to 2,523 units in the preceding week and 1,253 units during the corresponding week in 1941. Total August production was 11,622 units as compared to 11,867 units in July.

Manufacturers Announce Plant Expansion Plans

Many electrical manufacturers are making additions to their plant facilities.

General Electric Co. has purchased the 58,000 sq. ft. factory it has been leasing in Lowell, Mass., since 1944. The plant is manufacturing electric cords, for household appliances, fluorescent lampholders, and metals parts that are used in the company's manufacturing operations elsewhere.

To provide additional plant facilities, Ripley Co., Inc., Torrington, Conn., designer and manufacturer of electronic equipment, has purchased the former Pratt, Read & Co. plant at Deep River, Conn. In announcing the acquistion, Louis R. Ripley, president, stated that the new plant will begin production shortly of several new items, while the company's plant at Torrington will continue to be used primarily for research, design, and development operations.

A new $600,000 expansion program, designed to rearrange and modernize plant facilities, increase production, and reduce manufacturing costs of heating, home cleaning equipment and other appliances, is now under way at the Eureka Williams Corp. factory in Bloomington, Ill., H. W. Burritt, president, has announced. New assembly lines are being built, overhead conveyor systems installed, new machinery, jigs and fixtures added, and bake ovens and spray boths constructed. The program also calls for expansion of engineering, research and development laboratories, as well as executive offices. A separate building on the company's property also will be reconverted into a testing laboratory in which continuing studies of materials, sound wear, and products will be conducted.

An expansion program which will practically double the capacity of its Blue Island plant has been announced by J. H. Watters, president of Union Asbestos & Rubber Co. of Chicago, a manufacturer of asbestos insulation. The first part of the program, involving the installation of additional heavy machinery and equipment, should be completed in early fall and the second part, involving extensions of several buildings, should be ready by the first quarter of next year.

Three of the seven plants used during the war by Walter Kidde & Co., Inc., at Belleville, N. J., have been purchased by the Kidde Company from the government for a total price of $1,800,000, John F. Kidde, president, has announced.

Lear, Inc., has purchased another plant in Grand Rapids, Mich. The plant will be used to assemble console and phonograph combination home radios, record changers, wire and tape recorders and variable capacitors. This is the third plant acquired by the company in Grand Rapids and the fourth now owned by Lear. The other plant is in Piqua, Ohio.

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Manufacturers Make Sales Assignments

Electrical manufacturing companies have recently made the following appointments to their sales staffs:

LOCKE INSULATOR CORP. has assigned L. M. Backus, Jr., to the staff of the Pittsburgh district with headquarters at Cincinnati, Ohio; Hubert M. Carmichael has been added to the Atlanta district with headquarters at Jackson, Miss.; John W. Mangold has been appointed sales engineer in the Baltimore district, with headquarters at Baltimore; P. H. Reynolds has been added to the staff at the Atlanta district office; R. W. Sebastian has been appointed sales engineer in the Chicago district, with offices in Chicago, and A. H. Dillman has been appointed district manager of the Philadelphia district with headquarters in Philadelphia.

ALLIS-CHALMERS MANUFACTURING CO. has named Richard F. Muller manager of the New Orleans district office, succeeding F. W. Stevens, who after 41 years of service has requested to be released from this responsibility.

PROGRESSIVE WELDER CO. has appointed K. P. Swanson, 204 Chapel St., Abington, Mass., to represent it in eastern Connecticut, eastern Massachusetts, Rhode Island, Maine, Vermont and New Hampshire. Mr. Swanson joins V. A. Chern and H. B. Axtell, who maintain offices at 15 Gramercy Park, New York 3, and 171 Forest Ave., Verona, N. J., respectively, in covering the New England area, Mr. Chern covering the New York metropolitan district as well as western Connecticut and western Massachusetts, while Mr. Axtell covers eastern New York and northern New Jersey.

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Appliance Shipments Up

Total value of shipments of small electric appliances in June rose to $13,100,000, representing a 25 percent increase over May shipments of $9,900,000, according to a report released by the Bureau of the Census. Increases in value of shipments, ranging from 17 to 77 percent, were recorded for electric fans, dry shavers, electric irons, heating pads and blankets, domestic cooking appliances, drink mixers and whippers and food mixers, while slight decreases were registered for electric air heaters and commercial cooking appliances.

Starts Production on New Steel Frame A.C. Motor

A new line of alternating-current motors has been started in production at the new Buffalo, N. Y., plant of the Westinghouse Electric Corp. The first of the types to be built is the squirrel-cage induction motor in the popular integral horsepower sizes.

Both mechanical and electrical improvements are incorporated in the design and the motor is built to NEMA specifications. Major item is the use of a steel frame and thus the physical size of the motor is smaller than its predecessor with cast iron frame. Although the size has been reduced, electrical properties have not been sacrificed, according to the manufacturer. High efficiencies and power factors have been maintained and starting and maximum torques have been increased per pound of motor.

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Diesel-Electric Produced on Assembly Line Basis

Diesel-electric units for railway motive power are being produced on a mass assembly line basis at the American Locomotive Co.'s Schenectady, N. Y., plant. The line last week produced its first completed unit—the company's 75,000th—which was a 6,000-hp., Alco-G.E. unit for the Super Chief on the Santa Fe.

W. L. Lentz, vice-president in charge of manufacturing, pointed out that the line is just beginning to produce and that it will be well into next year before the expected three units per day will roll off the line under their own power.

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Duro Company Acquired by Hydraulic Machinery

Hydraulic Machinery, Inc., Dearborn, Mich., has acquired control of the Duro Co., Dayton, Ohio, manufacturer of electric pumps, water softeners, turbine deep well pumps, turbine shallow well pumps, ejector pumps and water treatment equipment.

Present operation of the company occupies a plant area of 115,000 sq. ft., 200 people are employed and the backlog of orders is $1,500,000.

New officers include: president, Harry L. Wise; vice-president, Roe Heal, and secretary and treasurer, Robert Wise.

In making the announcement, Harry L. Wise, the new president, stated that no change in operating personnel was anticipated.

FIELD REPORTS ON BUSINESS

Electrical business in New York area was hard hit by the local truck strike. Inquiries are being received on various lighting projects. Wiring device shortages are hampering construction. Range sales promising, when deliveries permit.

PACIFIC COAST

War-time gain in population plus post-war increase has placed California next to New York and Pennsylvania as the third largest state. The increase since 1940 is estimated at 2,320,000, the total at 9,225,000, which is reflected in the number and size of housing projects which are by no means concentrated in the Los Angeles and Bay areas. Many a smaller community which never recorded a $1,000,000 in building permits in several years has one or more housing construction jobs under way. The electrical proportion of such work is small but shear quantity adds up to huge totals of a comparatively few staple items, strictly allocated. Wholesalers, however, maintain close touch with electrical contractors and endeavor to provide those with jobs under way or about to start with sufficient material to carry them along from week to week through the various stages from roughing in to outlets, switches and fixtures. This is also true of the other Pacific Coast states. Subsequent purchases, especially of appliances, will greatly increase the electrical importance of all this work.

REA construction is very active in the Northwest, as work progresses on the many jobs, averaging $200,000 each, placed in early spring, though the usual seasonal lag has cut announcements of new work to a few smaller installations. Heavier work is also limited to a few short sectors, such as the 29-mile, 69-kv., wooden pole, #2/0 aluminum line from Davis Dam to Kingman, Ariz., low bid being $92,469 and 39 miles of 115 kv. line between Alamogordo and Hollywood, N. M., low bid for which was $156,790.

CHICAGO

Proposed electrification of 15 railroads entering Chicago received a setback recently when road officials reported the move too costly. The change was advocated as a means of reducing the smoke nuisance in the city. As alternatives, the roads will use more diesel locomotives and anti-smoke devices.

Chicago's chief electrical inspector has asked all branches of industry to contribute suggestions for the modification of the city's 1938 electrical code to allow for such developments as fluorescent lighting, infrared and high-frequency heating, electronic devices and new methods of metering and switching.

Wisconsin Public Service Corp., Milwaukee, has acquired control of the Tomahawk hydroelectric project on the Wisconsin River in Lincoln County, Wisconsin, where it will reconstruct the dam and build a new powerhouse containing two turbines, each with a 2,070-hp. capacity, and two 1,300-kw. generators.

As part of its sales promotion, Indiana & Michigan Electric Co. has worked with the South Bend, Ind., high schools to set up studies in kitchen and laundry planning and in adequate wiring as part of their home economics courses. Similar studies will be offered at adult evening classes.

NEW ENGLAND

Narragansett Electric Co., Providence, R. I., has ordered a 40,000-kw. General Electric steam turbine unit and will shortly contract for a boiler rated at 450,000 lb. per hour for the Manchester Street station. Coal handling facilities to be added, with building extension, bring the total cost of this project to about $7,000,000. Western Massachusetts Electric Co., Springfield, will build a new steam plant at West Springfield, the initial unit to have a rating of 40,000 kw.

Architects and electric utility illuminating engineers are being consulted on many lighting projects ranging from store front displays to sizable industrial installations. Wiring device shortages are hampering construction progress, though portable lamps and radio sets are being merchandised on a good scale. Refrigerating projects in New England are extremely active, with storage units and deep freezing outfits in heavy demand. Inquiries for commercial electric cooking units are in large volume. Household range sales promise vigorous development when deliveries permit.

NEW YORK

Electrical apparatus and appliance business was hard hit by the local truck strike. Movement of materials and finished goods was practically at a standstill. Manufacturing output continued as usual where shortages did not interrupt production, but most plants found it necessary to curtail operations. Already short supplies of steel, copper, lead and insulating materials were soon used up in most plants and new supplies could not be shipped in because of the strike.

Those items which were completed are choking up shipping rooms since it was impossible to send them to customers. After the strike is settled it is expected to take several days before normal operations can be resumed.

Several distributors report that billings for the third quarter are the highest in history. Apparatus and appliances are arriving in continued greater volume and are being shipped to industrial and retail customers as soon as they arrive. On the surface, these sources report, there is no indication of the pipe line filling.

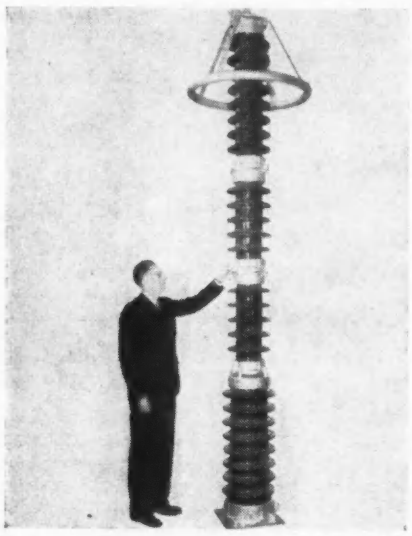
Manufacturers questioned about the new NEMA standards emphasized that no immediate effect will be noted on supplies but that it will materially affect the production and supply conditions of 1947.

New York sources have found no indication of a "buyers' strike" in any electrical items of known brands. These are being snapped up as soon as they appear on retailers' shelves. Unknown brands are running into sales resistance. They are being offered at 30 percent discounts in several local areas.

NEW EQUIPMENT

121-Kv. Lightning Arresters Stand Without Help

As TRANSMISSION line voltages increase, so does the height of lightning arresters, more and more units being piled on top of each other to withstand the higher potentials. The height of arresters rated above 100 kv. has been such as to require a support at the top to resist pressures developed by high winds. These braces must be insulated, as the top of the arrester is at line potential.



Thus the braces and necessary structure complicate the switch yard and add to its expense.

Braces part way up would be at lower potential and somewhat simpler but their effect is to upset the voltage distribution over the arrester, resulting in either unsatisfactory arrester operation or the use of higher voltage arrester.

The problem is being solved in new equipment announced by Westinghouse Electric Corp. by making the bottom section of the arrester larger in diameter than the others. Rated electrically at 37 kv., this section is used as the bottom unit of the arrester stack where mechanical stresses are the greatest.

Standard 25-kv. and 38-kv. units are mounted on the more massive unit in the usual fashion to make up 109-kv. and 121-kv. arresters. The arrester is interchangeable with present installations because the bolt circle of the new base section is the same as for previous foundation castings.

The company reports that a costly structure needed solely for bracing the arrester is no longer required, making a simpler installation and making protection with lightning arresters more economical

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New Line of Capacitors Wound in Conditioned Room

A NEW LINE of capacitors for power factor improvement application on circuits from 2.4 to 13.8 kv., which Line Material Co., 800 North Eighth St., Milwaukee 1, Wis., reports is so designed that unit stress is more conservative, has been announced by that company.

The manufacturer reports that the packs are wound in a special winding room which is temperature and humidity controlled and cleaned to prevent contamination by foreign matters. Drying and impregnating of the pack is accomplished by a new type oven in which each unit is given individual attention throughout the process. Each capacitor is impregnated with non-inflammable Elemex.

Packs are insulated from the tank by staggered and overlapped multiple layers of paper with wrapped and folded top and bottom surfaces. Other features reported include welded tank of copper-bearing steel with bottom recessed to avoid tank abrasions, two-piece porcelain bushings which are elevated on rain sheds and doubly sealed above and below cover stock with cemented resin-bonded cork gaskets, and use of parallel grooves, non-separable terminals and built-in discharge resistors.

The capacitors are reported to meet NEMA requirements with regard to voltage rating, insulation strength, radio noise, heating and discharge resistors.

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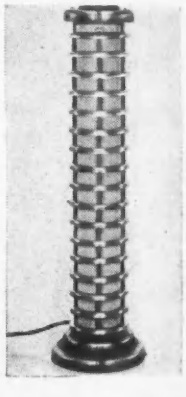
Stand Type Electrical Room Heater Developed

A NEW circular stand type of electrical room heater has been announced by Tepfer Appliance Co., Cincinnati, Ohio. The heater stands on a 6-in. diameter base and is 30 in. high. It utilizes a series of aluminum louvres to force the heat outward in a rapid circulating motion. The heater is reported as in balance even when jarred or overturned. Its protective features are said to guard children, rugs, draperies, and pets from burns.



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New Tube Has 10,000 Gain Over Band Width of 800 Mc.

A NEW TUBE which is expected to have widespread applications in long distance telephony, especially in microwave radio-relay systems, and to be of great importance in sending television across the country, was revealed recently by Dr. J. R. Pierce, Bell Telephone Laboratories, 463 West St., New York 14, N. Y.

Preliminary tests indicate the tube may amplify dozens of full color or black and white television programs simultaneously. Or it might theoretically handle more than 10,000 simultaneous cross-country telephone conversations or over a hundred million words a minute by telegraph. Conservative

figures for the new tube show a power gain of 10,000 times over a band width of 800 megacycles, the laboratory reports. By comparison the present pentode tube can give a power gain of 10 times over a band width of 20 megacycles, and a velocity modulation tube, operating in the microwave range,

gives the same amplification over a band width of 10 megacycles.

It is only a little more than a foot long and only a few inches across. An entire amplifier hook-up, of which the tube is the heart, occupies a space less than two feet long and a few inches square.

Inside the foot long stem is the essence of the tube, a long coil of thin wire, or helix, running from one end of the stem to the other. The wave which is to be amplified is fed onto the coil at the bulb end through a wave-guide and then drawn off at the other end in the same way.

The wave travels along the coiled wire at the speed of light but because of the winding of the wire, it moves along the length of the tube at only a thirteenth of this speed. Meanwhile, from the bulb—actually an electron gun—a beam of electrons is shot through the inside of the coil down the stem in the same direction the wave is moving and at approximately the same speed, i.e., one-thirteenth the speed of light.

The speeds are not exactly matched, however, and on the average the electrons go faster than the wave. They tend to slow down, though, and in so doing, they give up some of their energy to the wave. As a result the wave gains a tremendous amount of energy and becomes many times amplified.

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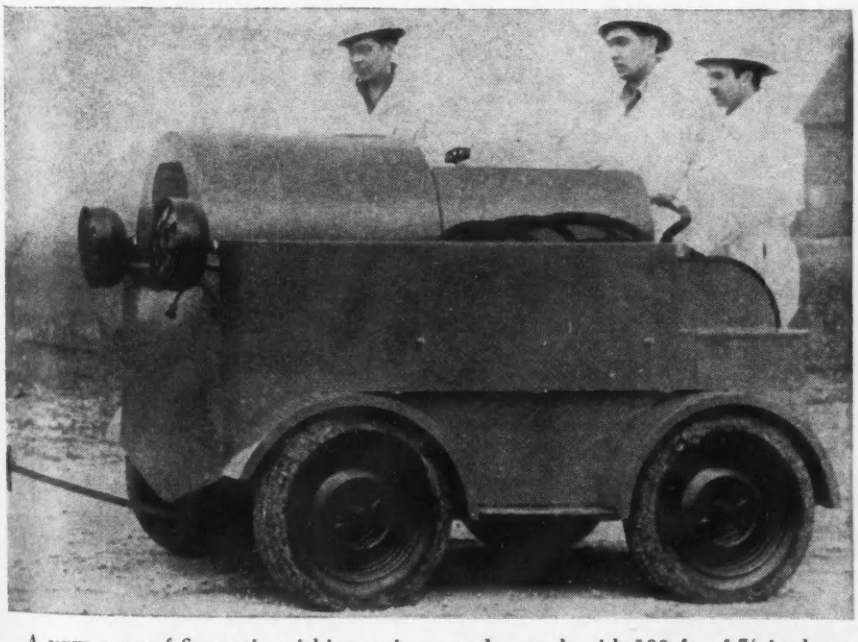
Fire Extinguisher Utilizes Both CO_2 and Foam



A NEW TYPE of fire-extinguishing unit designed to furnish protection for a wide range of outdoor industrial fire hazards has been introduced by Cardox Corp., 307 North Michigan Ave., Chicago 7, Ill.

The new unit has a capacity of 750 lb. of low-pressure liquid carbon dioxide and 32 gal. of mechanical foam solution. It has two long-range carbon dioxide nozzles, each with 100 ft. of ⅞-in. hose, which have a combined discharge rate of 400 lb. of carbon dioxide per minute. A foam gun, on a 100-ft., ⅝-in. hose line has a discharge rate of 18 gal. per minute, with pressure supplied by the carbon dioxide. The two extinguishing agents supplement one another.

The unit is a four-wheel trailer, using standard automobile wheels and front axle assembly and 6:00 x 16 tires. With a wheelbase of 52 in., front and rear tread widths of 58 and 60 in. respectively and an over-all height of 5 ft., 4 in., it exhibits exceptional stability even when hauled at high speed. A standard automotive towing bar enables quick connection to automobile, jeep or tractor. Step plates on sides and rear accommodate three firemen, each of whom mans a hose line. Tool compartments provide space for equipment and tools needed in fire-fighting operations.

Low-pressure liquid carbon dioxide is stored in the trailer in a single insulated, refrigerated pressure vessel at a controlled temperature of approximately 0 deg. F. and 300 psi. At this temperature the liquid carbon dioxide yields 47 percent CO_2 "snow" (finely divided particles of dry ice) when released.

Under conditions closely simulating actual industrial fires, this unit has successfully extinguished fires involving approximately 200 gal. of gasoline burning over a wide area on two or more levels, the manufacturer reports.

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Small Capacitors Designed For Light, Fast Operation

DEVELOPMENT of a complete new line of small, lightweight, d.c. Pyranol capacitors for use in flash-photography apparatus, light-metal welders, and similar applications requiring economical energy storage and fast discharge has been announced by the General Electric Co., Schenectady 5, N. Y.

The units are available in a wide range of ratings, with ambient temperature operating limits at rated voltage ranging from 0 to 50 deg. C. and capacitance tolerances at 25 degrees of plus or minus 10 percent.

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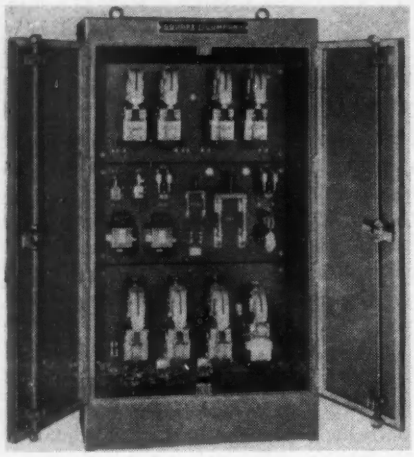
Heavy Duty D.C. Controller Designed for Severe Service

A NEW LINE of heavy duty d.c. controllers for steel mill auxiliaries, cranes and other heavy duty applications, where service is severe and continuity of operation is vital, has been announced by Square D Co., 4041 North Richards St., Milwaukee, Wis.

Contactors are available with 8-hr. ratings of 100, 150, 300, and 600 amp., and mill ratings of 133 percent of those values. They are reported to have high rupturing capacity, long life and to be rapid in operation. All parts are accessible for inspection and maintenance. Spring-closed contactors for dynamic braking are of a similar design.

Pneumatic timers that provide wide



range, time limit acceleration unaffected by fluctuations in temperature, voltage and other conditions of application can be mechanically attached to the contactors or operated by means of a separate magnet.

Control relays are of heavy-duty type, performing under-voltage, interlocking, sequencing and shunt-filled control functions. Mechanical design is similar to that of contractors.

Mill type overload relay combines inverse time thermal overload protection with instantaneous trip over-torque protection in a single device. Either automatic or remote reset can be obtained by simple reconnection of shunt holding coil. Instantaneous trip setting is indicated on calibrated scale.

Double door enclosures of heavy-gage steel are available in NEMA Types I, IA or V as standard. Doors have vault type handles. Removable back plates are equipped with retained screws to save time and prevent loss.

Non-reversing controllers are available with or without dynamic braking. Reversing controllers are standard with dynamic braking, plugging, or both dynamic braking and plugging. Extra points of acceleration, armature shunt and field protective relays are optional. All controllers are suitable for use with mill type master switch and can be furnished for pushbutton operation.

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Electric Truck Features Narrow Aisle Maneuverability

A 4000-LB. capacity electric power fork truck which has several maneuverability features has been reported by Lewis-Shepard Products, Inc., 222 Walnut St., Watertown 72, Mass. The manufacturer reports that using a 48-in. fork and carry a 48-in. load, the truck will enter a 12-ft. aisle and, in one continuous forward travel of the truck, make a single right angle turn and right angle slack, without backing or filling.

Improved Dilatometer Continuously Records Changes

AN IMPROVED automatic dilatometer for continuous recordings of the thermal expansion and contraction of a wide range of materials including metals, glass, ceramics and plastics has been announced by the electronics division, Sylvania Electric Products Inc., 500 Fifth Ave., New York, N. Y.

The equipment is designed to provide continuous graphic recording of the twelve-hour expansion and contraction cycles of samples. The instrument records automatically without the supervision of a laboratory assistant and thereby reduces both time and labor required for specimen study. Measurements begun during the afternoon of one day may be automatically completed overnight. Except for set-up time, the laboratory assistant is free for other work during the twelve-hour recording cycle.

In addition to eliminating the plotting of instant values by older methods, the recording densitometer permits determination of true variations in length even when samples exhibit exceptions to the rule of elongation as a function of temperature. This makes the equipment particularly useful in connection with the laboratory study of ferrous alloys at thermal critical points, the manufacturer reports.

The improved instrument is fully enclosed in a steel cabinet permitting ready access for set-up of specimens. Recording meter and other instruments are flush mounted, permitting visual indication of operating temperatures and the progress of thermal expansion curve plotting elongation against temperature, the manufacturer indicates.

The dilameter includes a furnace or or sub-zero cooling chamber, furnace thermocouple, concentric quartz tube, specimen thermocouple, gearbox and support, transmission, contact mechanism, electronic relay, and recorder. Each one of these principle units performs a separate function but all functions are closely coordinated to hold specimen temperature uniform within 1 deg. C.; provide uniform heating and cooling with the specimen in an inert atmosphere; automatic shut-off; and an over-all accuracy of 0.2 percent.

Accommodating 3-, 4- or 5-in. specimens, the dilaometer will accommodate temperatures up to 1,000 deg. C.; weighs 450 lb. and measures 56 in. wide, 50 in. high and 26 in. deep. It is designed for use at 110-120 volts, 50-60 cycle supply and is rated at 900-1,000 watts.

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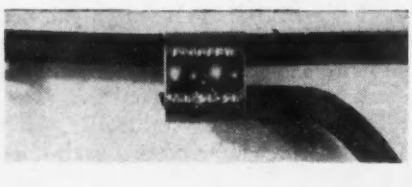
Gutter Type Tap Bolt Prevents Back Off

A NEW LINE of gutter type taps, Style GTS, available in sizes which will accommodate from No. 4 strand to 1,000 Mcm., has been announced by the Dosset Mfg. Co., 249 Huron St., Brooklyn, N. Y. The units are so constructed that there are no loose pieces. The threads on the bolts are rounded over to prevent nuts from backing off.

Cables may be inserted from either end or from the sides. Both conductor bearing surfaces are serrated to bite into conductor surfaces.

The cut body is made of a high alloy copper and contains two oval shaped holes. These receive the oval shoulders on the everdur bolts and thereby prevents turning.



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Selenium Rectifier Developed for Radio Use

SELENIUM RECTIFIER, which is 1 in. in diameter and ¾ in. long and is suitable for use in radios, has been announced by General Electric Co., 1285 Boston Ave., Bridgeport 2, Conn. It consists of five aluminum disks connected in series and is designed to withstand the inverse peak voltages obtained when rectifying (half-wave) 110-120 volts rms. and feeding into a capacitor. Continuous currents of 100 milliamperes can be obtained with a temperature rise below the safe limits, the manufacturer reports.